

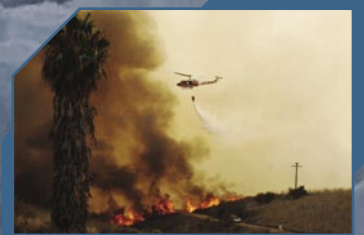
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PATHFINDER

THE GEOSPATIAL INTELLIGENCE MAGAZINE
SERVING THE FRONT LINE

JANUARY/FEBRUARY 2008



SUPPORTING THE FRONT LINE
ENSURING THE MISSION



DRIVING TRANSFORMATION
LOOKING AHEAD

Highlights of NGA's **2007 Accomplishments**

» MAPPING THE ARCTIC, PAGE 12



ON MY MIND

Looking Outward and Leaning Forward

NSA is vital to the success of virtually every mission in which our defense, intelligence and interagency partners are involved. Therefore, each and every NSA employee—civilian, military and contractor—directly contributes to NSA's ability to get the right information to the right people at the right time. This past year highlighted the tremendous talent and dedication of the men and women of NSA as we focused outward and leaned forward to engage our mission partners, both national and international.

Supporting the Front Line

As the United States increased support to the war efforts in Iraq and Afghanistan, NSA increased our forward deployment and reach-back support efforts. We did this all while balancing our domestic and non-time dominant mission support. Time and again embedding our NSA personnel in our mission partners' footprint allowed our products and services to be utilized in situations where otherwise they would not have been. Our NSA Support Teams (NSTs) live and breathe the battle rhythm of our mission partners and gain specific insight into detailed operational requirements, allowing NSA to best meet and anticipate the front-line needs of our partners and ensure that geospatial intelligence (GEOINT) is effectively absorbed.

Ensuring the Mission

In our evolving threat environment, we must ensure mission success through collaboration and partnerships. Over the past year, NSA participated in additional outreach with intelligence and defense community leaders to address opportunities for further partnerships. We also increased our Commonwealth partner interaction to capitalize on the talents, resources, perspectives and capabilities they bring to mission support. Additionally, NSA held two NST Conferences to foster two-way communication between the NST front lines and NSA leaders to plan for future mission accomplishments. This past year we also saw the National System for Geospatial Intelligence (NSG) grow in influence as senior leaders and directors from across the defense, intelligence and interagency communities, as well as our Commonwealth partners, met quarterly at the NSG Senior Managers' Council. Ongoing support from senior leaders, such as retired Air Force Lt. Gen. James R. Clapper Jr., Undersecretary of Defense for Intelligence; Marine Gen. James E. Cartwright, Vice Chairman, Joint Chiefs of Staff; Army Lt. Gen. Michael D. Maples, Director, Defense Intelligence Agency; Randall M. Fort, Assistant Secretary, Intelligence and Research, Department of State; Ambassador Kenneth C. Brill, Director, National Counterproliferation Center; Charles Allen, Undersecretary for Intelligence, Department of Homeland Security (DHS) and Army Lt. Gen. John F. Kimmons, Deputy Chief of Staff for Intelligence, is recognition that the NSG plays a vital role in national security.

Driving Transformation

NSA is dedicated to ensuring our mission partners get the information they need to make critical decisions, on demand. This past year NSA saw unprecedented advancements with the deployment of several GEOINT initiatives, the launch of a new commercial imagery system, quality of analysis improvements and various human capital initiatives such as the Workforce Excellence Plan and Foreign Language Proficiency Pay. Of specific note was the accelerated progress of our online GEOINT capabilities. In June, NSA rolled out Google Earth™ on two military networks. With the capabilities of multiple discovery and access to data through GEOINT Online, NSA's partners will have a better capacity for finding and retrieving the GEOINT they need. Additionally, the groundbreaking at the New Campus East in Springfield, Va., and various mission enhancements in the West marked a new era for NSA. For the first time in our history, our eastern operations will be consolidated in one location. The impact of this mission deployment to our operations, resources and culture will help establish organizational continuity, stability and mission effectiveness, as well as improve the way we do business, both in the East and the West.

Looking Ahead

NSA's mission is vital to the success of U.S. global operations. Each member of our Agency, from line directorates and staff offices to the enabling organizations and our deployed teams, has played a key role over the past year. With an ever increasing demand for GEOINT from our many mission partners, to include military, Intelligence Community, policy makers and DHS, our collective dedication to success is more important now than ever before. We each have a measure of responsibility for fulfilling the Agency's mission and for the quality of information provided to those making critical decisions; we performed this admirably over the past year. Thank you for your dedication to duty and commitment to our nation's security. I look forward to working with you and achieving even greater things in 2008.


ROBERT B. MURRETT
Vice Admiral, USN
Director

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ON THE COVER

“Supporting the Front Line,” one of the key themes in this Pathfinder, could involve creating geospatial intelligence (GEOINT) for the Arctic. With renewed interest in this region, NGA recently supported the Coast Guard and other customers with GEOINT products destined to play an important role in defending U.S. interests there. See “Lomonosov Ridge Model Aids in Mapping Territory Rights” by Heather Cox on page 12. Three other key themes are also used in this Pathfinder to group NGA’s 2007 achievements: “Ensuring the Mission,” “Driving Transformation” and “Looking Ahead.” The highlights begin on page 7 with “NGA Prototype Enables Collaboration with the Field” by Neil Hartbarger. Photo ©2007 Jupiterimages Corp.

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LETTER TO OUR READERS

2007 Highlights

With the advent of a new year, there is much to be thankful for and much to look forward to. In the dark of winter, much at NGA shines brightly, leading the way for the Intelligence Community. New Campus East is in its early stages of construction, and there have been important advances in the world of geospatial intelligence. To that end, it seems appropriate that the theme of this month's issue is "accomplishments and achievements."

NGA is consistently recognized for innovation and excellence. Our Internal Control Program won an award for the Department of Defense "Check It" campaign. The Open Geospatial Consortium (OGC) honored NGA with the OGC Vision Award, and Ernie Moore details the high praise the MATRIX program received.

Issues concerning both the warfighter and the civilian continue to be in the scope of NGA's lens. The recent launch of the Digital Globe WorldView-1 (WV-1) spacecraft in September represents a quantum leap in the capabilities of U.S. space-based commercial remote sensing. In "NGA Supports California Wildfires Suppression," John Godby details our NGA Support Team's courage and commitment in a dangerous situation.

We are making progress in many areas, both at home and abroad. Internationally, our NSTs are providing critical support for many issues. "NGA Delivers New Technologies to Bulgaria" celebrates the installation of a new photo facility in a post-Cold War nation. "Lomonosov Ridge Model Aids in Mapping Territory Rights" discusses our creation of a three-dimensional model that will assist the U.S. Coast Guard and national leaders in examining some of the newly exposed Arctic region.

Another significant area of leadership is technology. "eGEOINT Will Help NGA Become More Service-Oriented" focuses on our commitment to quality customer service. In "Analysts Map Avian Flu in Real-time Collaborative Environment," Jim Long details how one of our teams worked quickly and efficiently to develop the Avian Influenza Mapping System. It will reduce the time analysts spend on mundane tasks so they can focus on delivering information to decision-makers.

Our March/April issue will have an international focus and examine the many ways we provide support to customers and civilians worldwide. Through the tireless work and unparalleled service of its members, NGA continues to "know the earth, show the way." Best wishes for a peaceful and prosperous New Year to you and yours.



Paul R. Weise

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Director, Office of Corporate Relations

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GETTING PUBLISHED

All members of the geospatial intelligence community are welcome to submit articles of community-wide interest. Articles are edited for style, content and length. The copy deadline is the last Friday of the third month before publication. For details on submitting articles, send an e-mail to pathfinder@nga.mil.

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UP FRONT

Open Geospatial Consortium Honors NGA

BY JASON K. MICHAS

The Open Geospatial Consortium (OGC) honored NGA with the OGC Vision Award at a ceremony on Oct. 17, 2007, at the Army and Navy Club, Washington, D.C. Steve Wallach, NGA Technical Executive, accepted the award on behalf of the Agency, commenting, “We have been partners with the OGC from their beginning and highly value our strategic relationship. The work of the OGC has been and will continue to be a key factor in our success, bringing interoperable data and services to the warfighter and decision-maker.”

In his letter to NGA announcing the award, OGC Chairman David Schell explained, “The OGC Vision Award was established to recognize the remarkable contributions of a member institution to advance the consortium’s vision of the benefits of geospatial information in the world community.” Schell continued, “For over a decade, both the leadership and professional staff of NGA have been far-sighted and innovative in their support of OGC programs to lead industry alignment on open standards of importance to geospatial intelligence (GEOINT) requirements.”

The OGC, an international nonprofit organization, comprises more than 350 government agencies, private companies, research institutions and universities. The consortium seeks through a consensus process to develop voluntary public standards for geospatial and other location-based information services.

Responding to the need to instill greater cooperation within the intelligence system following Sept. 11, 2001, NGA created the National Center for Geospatial Intelligence Standards (NCGIS) to support the effort to standardize GEOINT in a networked environment. The NCGIS represents NGA as a key member of the OGC, supporting and working with the consortium to ensure that National System for Geospatial Intelligence (NSG) requirements are met. NGA and the NSG benefit greatly from the OGC’s development, alignment and promotion of openly available geoprocessing standards.

NGA and the OGC’s commitment to the shared vision of common GEOINT requirements is reflected in the NGA publication Geospatial Intelligence Standards: Enabling a Common Vision, which outlines the standards that will be used in the NSG to share, manipulate and exploit digital geospatial data. The document endorses a set of key specifications known as the OGC Spatial Data Infrastructure (SDI) 1.0 baseline.



Photograph courtesy of Open Geospatial Consortium, Inc.

NGA Technical Executive Steve Wallach (right) receives the OGC Vision Award from David Schell, Chairman of the Board of the Open Geospatial Consortium, Inc. (left).

The Under Secretary of Defense for Intelligence, retired U.S. Air Force Lt. Gen. James R. Clapper Jr., who served previously as NGA Director, attended the ceremony. He remarked, “It is very gratifying to me to see that the NGA–OGC relationship has not only continued but strengthened over the years. The importance of standards and their promulgation and enforcement cannot be over-emphasized.”

Commenting on efforts to encourage common GEOINT standards, NGA Director Navy Vice Adm. Robert B. Murrett has stated, “Having GEOINT standards that are universally adopted and implemented across the defense and intelligence communities, as well the entire U.S. government and our coalition partners, is crucial to mission success.” Murrett has emphasized, “Standards ensure that GEOINT data, services, and products—regardless of source—are timely, accurate and interoperable.” P

JASON K. MICHAS

is a Staff Officer in the Office of Corporate Relations, Strategic Communications Branch.



UP FRONT

NGA Wins Award for 'Check It' Campaign

BY CHRISTIAN TIPTON AND JOHN SCHEIRER

At the end of fiscal 2007, NGA Director Vice Adm.

Robert B. Murrett received a Certificate of Excellence in recognition of NGA's implementation of the Department of Defense (DoD) "Check It" campaign from the Honorable Gordon England, Deputy Secretary of Defense. Mark Ward, Deputy Chief of NGA's Financial Reporting and Control Division (FMC)—the division delegated to run the program—received the certificate on behalf of the Director.

The "Check It" campaign was initiated in fiscal 2007 to increase awareness of the value of the Internal Control Program (ICP) throughout DoD and recognize the efforts of individual agencies. The DoD program developed posters and TV commercials to show how internal controls used by different departments, such as finance, acquisitions, logistics and information technology, can affect how the warfighter completes the mission.

NGA's FMC initiated a new ICP Awareness Program aimed at informing the entire workforce of the importance of internal controls and individual roles in supporting the warfighter. Starting with the production of a brochure in 2006 explaining the ICP, the program expanded in 2007 with a series of internal Web news announcements, plasma screen videos, posters, and DoD's "Check It" campaign commercials for NGA's TV newsbreaks.

The ICP is an initiative that ensures checks are in place throughout NGA using an outward systems approach to mitigate the risk of fraud, waste and abuse. Under the passage of the Federal Managers Financial Integrity Act of 1982, the Director is required to annually assess the "effectiveness, efficiency and reliability" of the ICP. This is done through issuing a Statement of Assurance (SOA) that says there is reasonable assurance that controls are in place and that they are working effectively.

The passage of the Sarbanes-Oxley Act of 2002, designed to mitigate corporate scandals, became the driving force to reinvigorate the ICP at NGA. Starting in fiscal 2004, the ICP moved from a strictly financial resource focus to an NGA-wide holistic approach that established assessable units. These are what the ICP uses to identify work processes based on major products and processes. Using a holistic approach pushes offices to evaluate their efficiency and manage risks in their work that do not have a direct impact on financial resources.

Using the ICP framework shown in the implementation guide of Office of Management and Budget Circular A-123, Management's Responsibility for Internal Control, the first step was to create a control environment. This environment is established by the agency's tone at the top level and is pivotal in determining the success of the program. NGA's Director has set the tone to "look outward and be the most collaborative partner with the Intelligence Community and warfighter" as the top focus area. In fiscal 2006 the NGA ICP submission was rated as first place within the Intelligence Community and tied for fourth place throughout DoD.

NGA's ICP also improved by working to exceed regulatory requirements through updating the NGA ICP policy instruction and drafting the charter for the Senior Assessment Team. This is a team of five Key Component (KC) directors who provide oversight and accountability for NGA's internal controls specifically for financial reporting. Financial reporting requires a separate SOA as required by OMB. Additionally, the ICP team designed, conducted and updated training for Internal Control Administrators (ICAs) and Assessable Unit Managers (AUMs) including a refresher seminar. The ICP team also created a web page and designed a Web-based database that is used to document the risk and control activities entered by the ICAs and AUMs. P



CHRISTIAN TIPTON AND JOHN SCHEIRER

work as contractor Financial Systems Analysts in the Financial Reporting and Control Division.



UP FRONT

Program Cited as 'Best Practice' in Report to Congress

BY ERNIE MOORE

NGA's MATRIX Program was listed as a key initiative and best practice for acquisition workforce development in the July 2007 Defense Acquisition Transformation Report to Congress. The Department of Defense recognition reflects the efforts of many on the NGA staff dedicated to improving the development of program managers, the contracting officer's representatives and other acquisition professionals.

A robust program of 26 courses, MATRIX provides the knowledge, skills and abilities to help members of the acquisition workforce perform their critical acquisition functions effectively and with confidence. Developed and implemented by NGA's Component Acquisition Executive and NGA college, MATRIX represents a significant investment in NGA people, providing an acquisition workforce that has the capacity to change to meet tomorrow's needs.

Initial MATRIX development started with engaging the acquisition workforce to identify knowledge and skill gaps and to prioritize education and training needs. Courses were then designed and developed to meet those needs.

While course content has remained an essential ingredient in the curriculum, the MATRIX team has also placed a priority on identifying the best experts to teach the



courses. Today, top-quality commercial vendors as well as seasoned experts on the NGA staff serve as the MATRIX instructor corps. Further, NGA college's comprehensive Adjunct Instructor Training Program, a week-long instructor development course, is helping to ensure top-quality instruction from NGA experts with little prior experience in the classroom. Feedback and course evaluations indicate that the program is on track.

Efforts continue to develop the MATRIX Program to meet tomorrow's needs. The curriculum will continue to shift and adjust as further acquisition workforce needs are identified and processes change, and customer insight and feedback will make an important difference. P

ERNIE MOORE

coordinates the
MATRIX Program for
the Acquisition Contracts
Office as a contractor
employee.



Our Job

- Introduce practical management skills
- Customize your learning experience
- Highlight best practices
- Share our management experiences
- Provide follow-on consulting and support

Photo by Dick Fonner



SUPPORTING THE FRONT LINE

FEATURE ARTICLES

- » NGA Prototype Enables Collaboration with the Field
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SUPPORTING THE FRONT LINE

NGA Prototype Enables Collaboration with the Field

BY NEIL HARTBARGER

Three NGA organizations shared their resources in 2007 to create the prototype for a collaborative environment on the Web. With vital support from the InnoVision Directorate, the Analysis and Production Directorate is currently deploying the application on networks that link Intelligence Community analysts and front-line operators. With it, users anywhere in the world can add a comment or response to a shared space and, within seconds, it's available to every user.

Need to Keep Data Current

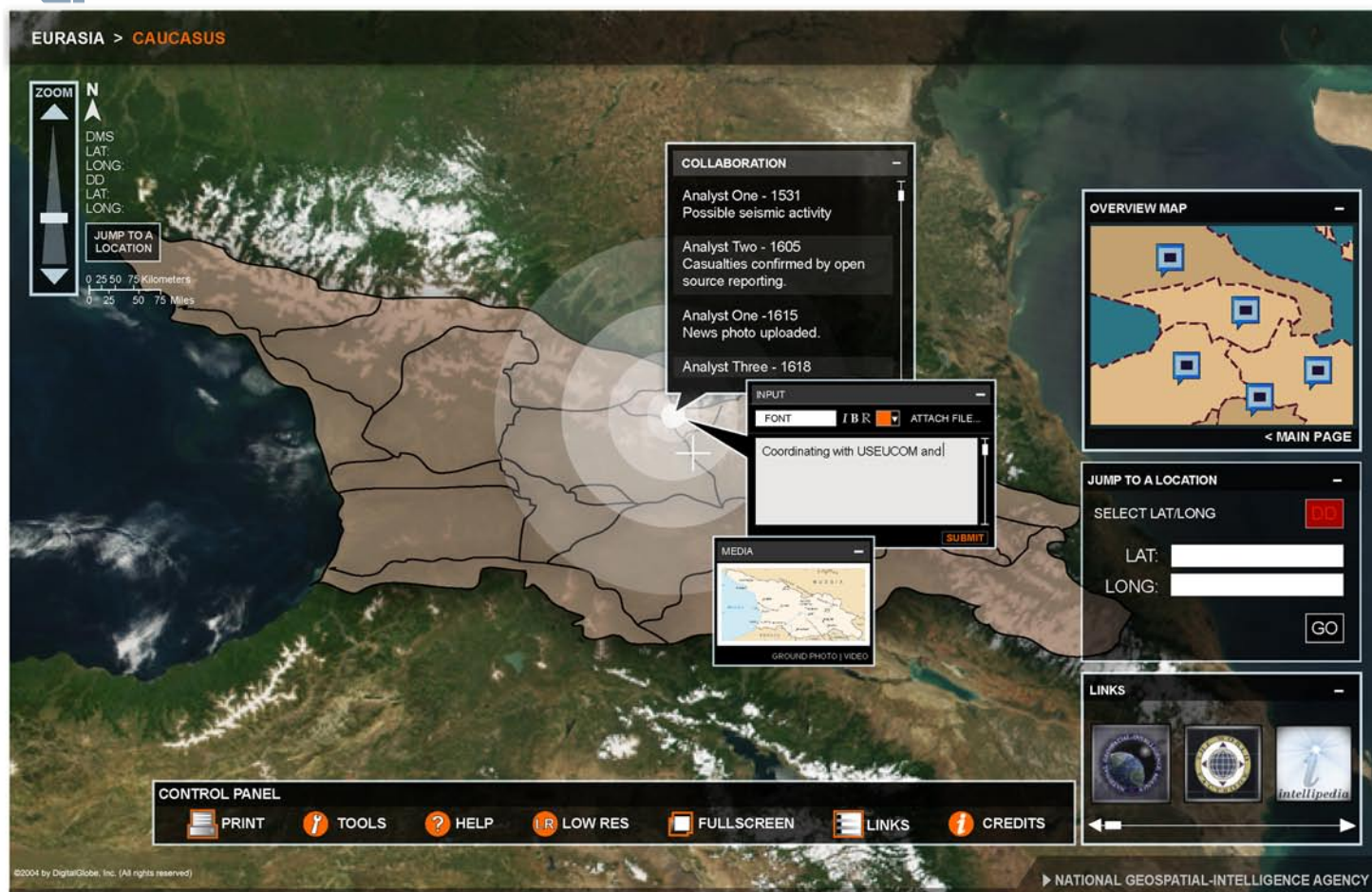
A group of analysts brought the idea for the prototype to developers in the directorate's Scene Visualization and Multimedia Branch. The analysts had experienced problems keeping data current in rapidly changing scenarios

with critical impacts for customers in the field. Too often, as soon as the analysts published data, it no longer represented the current situation.

The analysts wanted a collaboration environment to serve the entire Intelligence Community, as well as those on the front lines around the world.

In engineering the prototype, members of the branch aimed to provide a quick, intuitive, universally available user interface for both skilled geospatial intelligence analysts and users who simply need to visualize and respond to intelligence plotted in a geospatial environment.

Teaming up with a Web/database developer, the branch developed an interface that allowed users to directly update a master database, providing near-instant display of the new



A prototype application that allows analysts to collaborate in real time with operators is being deployed by NGA.



data worldwide. The interface uses Adobe Flash® technology, a popular method for adding graphics and interactivity to Web pages, and JavaScript, a scripting language best known for its use in Web sites.

Flash® and JavaScript give analysts access to data in a visually rich and responsive interface, employing existing Web technologies. No downloads or installations are needed to make it usable, in contrast to other well-known environments, such as Google Earth™. Using familiar tools also saved developers from having to surmount a learning

curve in getting quickly to a deployable prototype. In three weeks the development team had their first prototype ready for NGA Tech Days, where presentation of the capability on a large monitor drew a crowd.

From Development to Deployment

Since that early demonstration last May, development has moved quickly. A principal design goal was accessibility. If the front-line users' workstations

don't have the current Flash Player® installed, for example, all the information they need is still immediately at hand on a Web page in HyperText Markup Language.

Data points are filtered based on their type, date of creation and regional location. The interface displays detailed information about a selected data point, including analytical information, user comments and hyperlinks to other Web locations. This information also includes additional media, such as photos, videos, shapefiles and Portable Document Format® files, which can be viewed and downloaded.

When Flash® is enabled, the application presents the information in a visually rich, click-and-drag environment. Analysts can also use this interface to add or update points or comments, or upload media. Where Web bandwidth is a problem, a lower-resolution version is automatically delivered.

Providing real-time collaboration requires a fast Web server with plenty of storage and processing power. At the same time, worldwide coverage requires comprehensive overhead imagery. As it happened, the InnoVision Directorate was standing up Google Maps™ servers on several networks. But InnoVision's Information Integration Office was prepared to offer even greater support. The loan of two dedicated Web servers on separate networks the analysts use made the rollout possible over the short term, avoiding a lengthy wait for the acquisition of new equipment.

Collaboration Is Next

Cooperation among three NGA teams is bringing a new capability to the community, from policymakers to tactical planners. Even more important, this new Web application enables collaboration. With its quick response time and broad availability, the application can speed communication between analysts and the field—in both directions. And, given the Flash® capability to draw lines, shapes and points, as well as display graphics and video, this environment will only grow richer with each revision. P

“Cooperation among three NGA teams is bringing a new capability to the Intelligence Community. This new Web application enables collaboration.”

NEIL HARTBARGER

is a Senior Multimedia Developer with an NGA contractor supporting the Analysis and Production Directorate's Scene Visualization and Multimedia Branch.



SUPPORTING THE FRONT LINE

NGA Transforms Dissemination While Improving CENTCOM Support

BY JIM OLSON AND BILL SMALL

NGA's Enterprise Operations Directorate (E) made significant impacts in 2007 on its initiative to transform the dissemination environment and improve support to customers in the U.S. Central Command (CENTCOM) area of responsibility (AOR).

The recent relocation of non-contract printing to an off-site facility demonstrates NGA's move toward digital dissemination, as the Agency also upgrades its data center in Arnold, Mo., to support operational continuity. The commercial imagery NGA provides has also proven to be a viable and imperative source of support for those responding to disasters in the United States and abroad.

Delivering New Commercial Imagery

The migration of E's Commercial Satellite Imagery Library (CSIL) to the Unclassified Imagery Library (UNIL) allows for commercial imagery data in NGA's archive to be integrated with other imagery sources at multiple security domains using a common architecture.

The National System for Geospatial Intelligence architecture has been upgraded to support the tasking, storage, dissemination and exploitation of new satellite imagery acquired through NGA's NextView program. NGA began receiving the new NextView imagery in November 2007. The delivery of NextView imagery to NGA, coupled with the completion of the CSIL-to-UNIL migration, provides a consolidated library of commercial imagery that can be shared with diverse customers across multiple security domains.

Supporting Front-Line Analysts

NGA is also transforming dissemination through its Demand-Based Geospatial Intelligence (DBGI) program, which aims to deliver high-quality digital mapping data to forward-deployed NGA analysts for customer self-service printing. A DBGI pilot is currently under way at Fort Bragg, N.C. E will conduct a DBGI proof of concept using technology provided by the Defense Information Systems Agency for order entry and tracking.


In addition to its transformation initiatives, E advanced information-sharing capabilities with the International Security Assistance Force (ISAF) in Afghanistan by implementing a network connection that allows the transfer of releasable geospatial intelligence (GEOINT).

Products Popular with CENTCOM

Based on customer requirements, E printed 685,000 copies of maps and 34,000 copies of the Iraq Country and Urban Atlases for the CENTCOM AOR. Providing the Iraq Atlases was one of NGA's biggest success stories in Iraq. Afghanistan Atlases are planned for the upcoming year.

E also printed 400,000 copies of a new-generation blood chit for the CENTCOM AOR. A blood chit is an illustrated message used to obtain help by fallen military aircraft personnel. The new CENTCOM AOR blood chit contains a message in 32 local languages, replacing the need for various blood chits for specific regions.

In 2007 E's Remote Replication System in Bahrain printed 630 charts and worked extended hours providing specialized products to the customers throughout the CENTCOM AOR. The directorate loaded more than 2,500 products into its upgraded Geospatial Intelligence Library (GIL) containing the entire product suite over the CENTCOM AOR. The Bahrain-based GIL allows NGA's critical data to be closer to the user and alleviates the downloading of large data sets over the network.

From reaching out to customers through site visits in Iraq and Afghanistan to providing GEOINT online, E made a significant impact in the dissemination environment in 2007. From warfighters serving in the Middle East to civilians who lost their homes in California wildfires, the needs of customers served as the impetus for the people of E to accomplish their mission in the NGA way. 

JIM OLSON AND BILL SMALL

Jim Olson is the Deputy Chief of the Media Transformation Division of the Enterprise Operations Information Management Office. He is in charge of Information Management's Demand-Based Geospatial Intelligence Transformation Initiative.



Bill Small is the Executive Officer for the Enterprise Operations Information Management Office. He is the Dissemination Issues Lead for the Iraq-Afghanistan Combat Operations Support Team.

Photo by Jim Olson

SUPPORTING THE FRONT LINE

NGA Supports Afghan Mapping Initiative

BY BRUCE KIRACOFÉ

The Afghan Mapping Initiative, a cooperative relationship between NGA and the Afghan Geodesy and Cartography Head Office (AGCHO), has roots going back to 2006.

In February of that year, U.S. Army Lt. Gen. Karl Eikenberry, Commander of the Combined Forces Command-Afghanistan (CFC-A), approached retired U.S. Air Force Lt. Gen. James R. Clapper Jr., who was then NGA's Director, and asked for the agency's support to modernize Afghanistan's national mapping agency.

NGA sent its first technical assessment team to AGCHO in April 2006. The team determined that AGCHO personnel had the requisite scientific knowledge to satisfy Afghanistan's national mapping requirements. AGCHO had already started on the path to digital remote sensing and geographic information systems (GISs) and had even established a Remote Sensing and GIS Institute. The team concluded, however, that AGCHO lacked the hardware and software infrastructure to support digital mapping and did not have an understanding of modern digital production processes.

In September 2006, NGA's current director, Navy Vice Adm. Robert B. Murrett, visited AGCHO headquarters in Afghanistan. While there, he met his counterpart, the General President of AGCHO, Engineer Abdul Raouf Yari. Raouf has been Director of AGCHO since the fall of the Taliban regime. The staff of AGCHO nominated Raouf to the interim, post-Taliban government to guide the development of AGCHO into a modern mapping agency. During the civil war in Afghanistan in the 1990s, many AGCHO officials fled to Pakistan or Iran. Only now are they beginning to come home, having been asked by the current government to resume their careers.

After returning from his visit to AGCHO, Murrett committed \$1 million in NGA funding to jump-start what was now being called the Afghan Mapping Initiative. But that commitment was just the beginning. To support AGCHO through this initiative, NGA had to conclude a Basic Exchange and Cooperation Agreement (BECA) with AGCHO. This turned out to be a yearlong process that included

اداره عمومی جیو دیری و کارتوگرافی

انسٹیوت ریموت سنسنگ و GIS

AFGHAN GEODESY & CARTOGRAPHY HEAD OFFICE

AGCHO

INSTITUTE OF REMOTE SENSING & GIS

The entrance sign to the AGCHO Institute of Remote Sensing and GIS.

drafting the BECA documentation, coordinating the effort within NGA and with the Department of Defense and getting concurrence from AGHO. NGA also established requirements, planned the activities, and garnered support from NGA organizations. Most of this early work was formalized through NGA country team meetings, composed of members of NGA stakeholder organizations and the International Affairs Steering Group, the office director-level group that guides international activities within NGA.

What the Future Holds for the Afghan Mapping Initiative

The Afghan Mapping Initiative plans to support the development of a modest mapping capability at AGCHO. As part of the initiative, NGA will install a nationwide geodetic network, procure and install a basic map production system, provide training and conduct joint AGCHO-NGA projects.

Additional NGA support in the planning and development of the Afghan Mapping Initiative came from the Office of International Acquisition, the National Geospatial-Intelligence College, the Office of International Affairs and Policy, the Office of Political Geography, the Source Global Foundation Office, the Office of Geodetic Sciences and many others within the organization.

NGA's representative to the Combined Security Transition Command-Afghanistan (CSTC-A), the successor agency to CFC-A, plays an important role in the initiative by providing CSTC-A requirements to NGA and day-to-day interface with AGCHO and the Afghan National Army. NGA is also coordinating its activities with the International Security Assistance Force.

At first glance, the AGCHO project is unlike anything NGA has done in the past because NGA does not normally enter into reconstruction projects. But the Afghan Mapping Initiative is similar to the rebuilding that NGA supported in Eastern Europe in the mid-1990s. Today the geospatial partnerships in Eastern Europe, most notably with Poland and the Czech Republic, represent some of NGA's most significant collaborations. The Afghan Mapping Initiative presents an opportunity for yet another winning partnership. **P**

BRUCE KIRACOFÉ

is a staff officer in the Office of International Affairs and Policy. He has worked on issues in the Middle East and the Horn of Africa. His current focus is Afghanistan and Central Asia. He joined NGA in April 2006 and has worked in industry and at State Department.





SUPPORTING THE FRONT LINE

Lomonosov Ridge Model Aids in Mapping Territory Rights

BY HEATHER COX

In the midst of an Arctic warming trend, NGA has joined the race to map out new international passageways once blocked by dense sea ice.

NGA is providing critical intelligence to help the U.S. Coast Guard determine economic rights to newly exposed Arctic resources through its creation of geospatial products that depict temporal Arctic ice extents and a 3-D topographic model of the Lomonosov Ridge. This under-sea ridge is the site of intense discussion as bordering nations, including Russia, Canada, Norway and Denmark, seek to control the economic impact of climate change.

Admiral Thad Allen, Commandant of the U.S. Coast Guard, recently expressed his great appreciation to NGA for the precision workmanship that went into constructing a detailed model of the Arctic ice cap featuring the Lomonosov Ridge. "The model provides a unique bird's-eye view of the Arctic ice cap that most people have never seen before," Allen said. "The model will be of inestimable value to me and the Coast Guard as we begin to consider

and discuss the implications associated with the many national and international interests within the region."

The polar ice cap has melted more than 20 percent since 1980 from ongoing climate change, according to the National Resources Defense Council. Scientists have estimated that the Arctic may be virtually free of summer ice by the year 2050, exposing valuable natural resources and strategic polar locations. Nations bordering them are expressing autonomous economic interests and are vying for exclusive rights to the wealth of resources in the region, including an estimated 10 billion tons of oil and gas deposits, diamonds, gold, platinum and other valuable minerals contained within the Arctic seabed. According to NGA and the North American Aerospace Defense Command/U.S. Northern Command (NORAD/USNORTHCOM) NGA Support Team (NST) analysts, a single nation would gain significant economic and geopolitical advantages if it could establish Arctic dominance.



Russian Expansion

The waning Arctic ice may also enable northern shipping lanes to be navigable for a significant portion of the year. The economic impact of passable northern sea routes could save billions of dollars annually in transoceanic commerce. The economic future of nations lies in the establishment and accurate depiction of geographic boundaries in the polar region.

This issue was brought to the forefront in late June 2007. Russian President Vladimir Putin reaffirmed Russia's 2001 claim that the Lomonosov Ridge is an extension of the Siberian continental shelf, and Russia, therefore, is due full economic rights to the region. Furthermore, in August 2007 two Russian mini-submarines traveled down to the Arctic seafloor near the North Pole and planted a Russian flag as a symbolic maneuver to bolster their economic (as opposed to territorial) claims to this region.

Numerous elements within NGA collaborated to produce the geospatial intelligence (GEOINT) visualization

tools its partners needed to better perform their missions in the Arctic region. The Department of Homeland Security (DHS) NST initially submitted a requirement for a model of the Lomonosov Ridge and high Arctic region. NGA engaged multiple teams, including the Office of Global Navigation's Maritime Services Division, Office of the Americas, Office of Analytic Visualization and Operations Research's GEOINT Solutions Division and Office of Targeting and Transnational Issues' Political Geography Division, to create this product. The NORAD/USNORTHCOM NST assisted the DHS NST by identifying northern sea routes, seasonal extreme ice cap coverage, and Russia's anticipated claim area. NGA analysts delivered geospatial products and model of Lomonosov Ridge to Allen in September 2007.

In addition to having worldwide impact, NGA's products also enhance security at home, providing the tool for effectively communicating the issue to the Coast Guard and national senior-level decision-makers. The model is not





only an accurate briefing tool, said NST members, it also allows the layman to comprehend and visualize the depth of the Arctic seafloor. In addition, the representation also depicts the surrounding nations that are stakeholders in the Arctic and have expressed sovereignty interests.

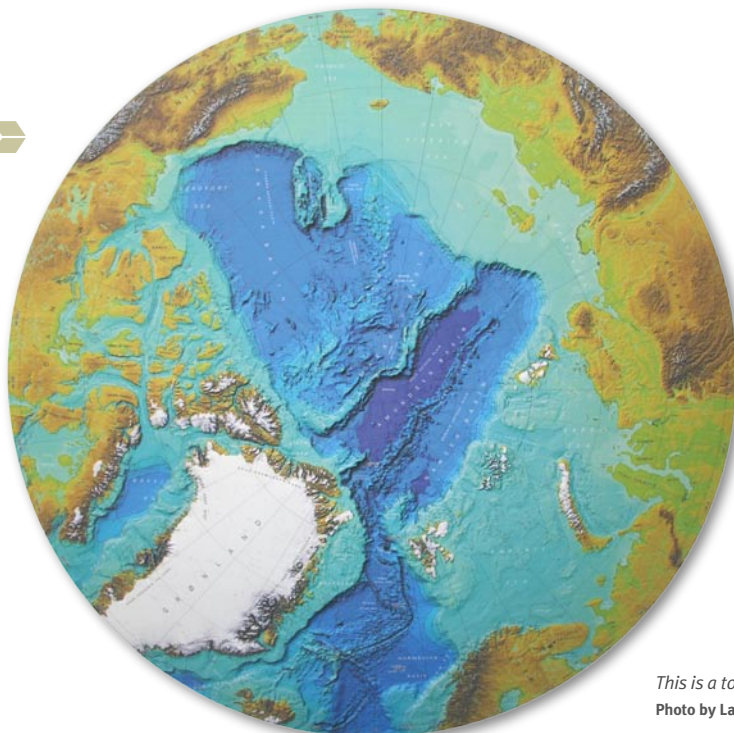
U.N. Involvement

The U.N. Convention on the Law of the Sea (UNCLOS), signed in 1982, indicates that “States bordering an enclosed or semi-enclosed sea should cooperate with each other in the exercise of their rights and in the performance of their duties under this Convention. To this end they shall endeavour, directly or through an appropriate regional organization:

- » to coordinate the management, conservation, exploration and exploitation of the living resources of the sea;
- » to coordinate the implementation of their rights and duties with respect to the protection and preservation of the marine environment;
- » to coordinate their scientific research policies and undertake where appropriate joint programmes of scientific research in the area;
- » to invite, as appropriate, other interested States or international organizations to cooperate with them in furtherance of the provisions of this article.”

NST analysts at NORAD/USNORTHCOM say Russia has a deadline of 2009 to substantiate their Arctic sovereignty claims by submitting scientific evidence to a U.N. commission for review in accordance with the UNCLOS treaty. It permits a state to extend its territorial sovereignty out to 12 nautical miles (nm) and sovereign rights to exploit and protect resources in its Exclusive Economic Zone (EEZ) out to 200 nm from its declared coastline. Other states are permitted complete freedom of navigation within an EEZ and are given the rights of innocent passage through territorial waters. Innocent passage is defined as passing through waters in an expeditious and continuous manner when no alternate route is accessible. However, coastal nations do reserve the right to temporarily suspend innocent passage as a security precaution.

As the economic future of the Arctic emerges, NGA people and products continue to be at the forefront of diplomatic activity. Analysts indicate NGA’s production directorate has established a High Arctic Working Group (HAWG) that will serve as the Agency’s subject matter experts on this and other issues in the region. The HAWG has and will continue to solicit knowledgeable membership not only within NGA, say sources close to the project, but across the entire Intelligence Community to ensure coordination, accuracy and collaboration. P



HEATHER COX

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This is a top view of the 3-D model of the Lomonosov Ridge
Photo by Larry Franklin

SUPPORTING THE FRONT LINE

NGA Supports California Wildfires Suppression

BY JOHN GODBY

On Oct. 21, 2007, several wildfires began to burn in Southern California. By the next morning the situation had changed drastically, as had the mission for an NGA Support Team (NST) deployed from the Office of Military Support.

The team chief flew into San Diego with the author early the following day as wildfires raged in the mountains east of the city. Evacuations were already under way as they met their team, who had deployed in support of the I Marine Expeditionary Force Mission (I MEF) Rehearsal Exercise that was to run that week at Camp Pendleton (CamPen), Calif.

With the situation becoming ever more fluid and dangerous, the team chief, in coordination with I MEF personnel, decided that the NST would assist the firefighting effort. The team immediately task-organized to take maximum advantage of its equipment and communications links, putting to work their substantive experience in military and civilian crises.

The team used a modified systemic operational design approach with a focus on defining the problem—how to support local efforts and leverage local and non-NGA assets. By developing a solution that tied in with local sources, the team operated for almost five days before the official national effort was fully under way. As the only NGA team on the ground until Oct. 25, the NST provided rapid and reliable GEOINT advice, data and products to the Marine Corps Installations (MCI) West GeoFidelis office, which manages geospatial information for Marine Corps installations, and the Marine Corps Base CamPen Crisis Action Team (MCB CAT).

Among the many support actions they performed, the NGA team made a very positive impact in developing a useable, near-real time common operating picture (COP) that was instrumental in all decision-making regarding emergency management. Although presented with tremendous logistical challenges and working in different locations to take the best advantage of available resources, team members were synchronized through clear and concise communication and a common mission focus.

More than 12 major fires raged across San Diego County that week, causing the evacuation of some 800,000 people and engulfing over 21,000 acres of Camp Pendleton,



DoD photo by Staff Sgt. Wayne Bitselly, U.S. Marine Corps

A UH-1N Search and Rescue Unit helicopter from Naval Air Station Fallon releases water onto a wildfire in an effort to control and contain the fires on Marine Corps Base Camp Pendleton, Calif., on Oct. 24, 2007.

including areas originally designated as civilian relocation sites. Two NGA team members not only served in an exemplary manner, but had to contend with the additional challenges they faced as residents.

The NGA team achieved its goals of assisting the MCI West and the MCB CAT to access robust data sets, and of keeping the COP current, emphasizing the importance of a variety of local data sources that included airborne and ground collection. By keeping MCI West “in front,” NGA forged another mutually beneficial relationship, not only with MCI West, but with other Marine Corps commands as well. **P**

JOHN GODBY

joined the Marine Corps NGA Support Team in September 2005. Prior to working at NGA, he was a defense contractor and a church administrator after a 21-year career in the Marine Corps as a Naval Aviator and Plans Officer, retiring as a lieutenant colonel.





SUPPORTING THE FRONT LINE

Analysts Map Avian Flu in Real-Time Collaborative Environment

BY JIM LONG

A small NGA team from the Enterprise Operations Directorate, in support of the Office of the Director of National Intelligence (ODNI), has developed the Avian Influenza Mapping System (AIMS) to track the spread of the virus. In early 2007, ODNI approached NGA on behalf of analysts who were spending an inordinate number of hours processing and communicating time-sensitive flu information to a broad base of users. The analysts needed an intuitive method to rapidly validate, aggregate and communicate information on the flu's status throughout the Intelligence Community, public health and nongovernmental organizations, and infectious disease experts, and to publish the results to a wide range of decision-makers. The AIMS team delivered the initial system within one

week of the ODNI request, and an operational Web site by the end of the second week.

The AIMS Web site has its roots in NGA's response to Hurricane Katrina and the lessons learned providing timely, unclassified imagery via the Internet in support of first responders and the general public. These lessons included the need for a simplified user interface, temporal data views to track hurricanes or infectious disease outbreaks over time, access to NGA and third-party data, and collaborative access to NGA's imagery and geospatial analysts. In response, NGA developed the capability for authorized users to dynamically add and share their own mission- and agency-specific data layers.



To map the avian flu, the AIMS team used this new layer feature to show poultry density geographically, which, when incorporated with a layer showing human density, proved extremely valuable. As a result of this new functionality, ODNI analysts have reduced the time spent on mundane tasks and can focus on distributing influenza data to decision makers in a simple, easily understood and collaborative framework.

Underlying AIMS is a virtual Web environment built on a geographic information system provided by NGA. This approach gives the Agency the ability to deliver data, services and expertise within a customer's own footprint

without requiring analysts to operate from an NGA workstation. In addition, this design allowed NGA to pass account and Web site administration to ODNI personnel.

ODNI and other customers can now collaborate internally with the assurance that their data remains secure—it can never be released without the knowledge and approval of appropriate authorities. Using AIMS, analysts from ODNI can now overlay flu-related intelligence on a collaborative geospatial foundation in a matter of minutes and share the resulting information in real time. **P**

JIM LONG

is the Chief of Applied IT Solutions in NGA's Enterprise Engineering Office. Before coming to NGA he was an Air Force officer supporting national intelligence systems in numerous assignments.





ENSURING THE MISSION

FEATURE ARTICLES

- » Visualize This! NGA Initiates GEOINT Visualization Service
- » Value-Added Commercial Imagery Has Arrived
- » Aero Services' Pursuit of Quality Reaches Milestone
- » NGA Delivers New Technologies to Bulgaria
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ENSURING THE MISSION

Visualize This! NGA Initiates GEOINT Visualization Service

BY SUE RILEY

It is an unforgiving fact that the volume of data available and relevant to intelligence analysis is ever increasing and, in high-tech areas such as geospatial intelligence (GEOINT), at alarming rates. With every NextView sensor adding potentially 500,000 square kilometers of imagery per day, new airborne sensors (still and motion) coming online monthly, national systems continuing to gather immense data stores, and non-image sources becoming increasingly important, the mere task of gathering data is massive. Once gathered, these sources must be understood and links between them fully grasped. Enter the GEOINT Visualization Service (GVS) and Google Earth™.

Visualizing data in three dimensions is a capability once limited to terrain and cultural features. The classic scene visualization was the flight simulator, initially a prediction of what a given area would look like for a flyer upon entering it for the first time. In Bosnia, for example, pilots could—from the comfort of their

base—“fly” a mission multiple times before entering enemy space.

Today, visualization is as important in initial data gathering and data compilation as it was in military operations just a few years ago; battlespace visualization has become a specialty in itself. While the user interface focuses on a globe of the Earth, the base data of that globe is a combination of NGA and commercial data in immense detail. Rather than having to start queries of multiple complex databases, analysts define their need in three-dimensional (3-D) space. GVS translates that need and reaches into relevant databases, gathering seemingly divergent and unrelated data into a single collection that can also be perceived in 3-D space. Analysts can then interact with that data in a visual way—all in that 3-D context—often seeing connections between diverse sources that were not readily apparent in their database form.

By deploying 3-D capability in analyst settings, NGA has become a leader in making data easily accessible for sharing and collaborative work across agencies. That deployment was no easy matter, as the deployment team had to orchestrate the installation of four systems (each component on multiple networks) while simultaneously coordinating installation of the application across the entire exploitation baseline and NGA desktops.

Visualization—a core GEOINT capability—is as important today in gathering engaging intelligence information as portraying it. Applying a commercial technology both broadly and intensely, GVS has brought visualization to this new level while achieving the “holy grail” of automated information systems: 100 percent availability/zero down time in its first four months of operation. **P**

SUE RILEY

is the Program Manager for several acquisition programs that support GEOINT visualization. She has over 29 years' experience supporting defense and intelligence customers through system development, cooperation with commercial partners and user engagement.



ENSURING THE MISSION

Value-Added Commercial Imagery Has Arrived

BY WHITNEY STEGER

NGA entered a new era in 2007 as our partners' reliance on commercial imagery—and the corresponding demand for it—increased to new levels. As a result, the Commercial Remote Sensing (CRS) Value Added Program has emerged as an advanced capability to meet the agency's overall mission. The program evolved from NGA's requirement to develop a comprehensive commercial imagery strategy and support the Intelligence Community (IC) and Department of Defense (DoD) with commercial imagery products. Leading this effort is the NGA Commercial Partnerships Division in coordination with the Commercial Solutions Division, which initiated such key value-added products as DigitalGlobe's CitySphere™ and the Three Day Orthomosaic Project.

During 2007, NGA acquired access to CitySphere's full suite of imagery-derived products, including unclassified orthorectified and mosaicked 60-centimeter resolution color imagery of over 200 cities worldwide. This data is updated at the rate of 15 cities per month, and none of the imagery is older than two years. With such current data of major international cities, CitySphere's products are able to serve as base maps for a range of geospatial intelligence

(GEOINT) applications and fulfill many unclassified urban imagery requirements for NGA, DoD and the IC.

The Three Day Orthomosaic Project allows NGA to inform a vendor of an area of interest, and, if applicable imagery exists in the vendor's archive, receive an orthomosaic within three days, as well as an option to task for new imagery when needed. Over 650 sites have been completed using this service. NGA used this capability in November 2007 to provide broad area imagery in support of humanitarian relief efforts in Bangladesh following Tropical Cyclone Sidr.

As NGA increasingly relies on commercial imagery, CRS value-added products and services are rapidly becoming essential tools for the agency to use in providing the best GEOINT to its customers. **P**

WHITNEY STEGER

is a contractor supporting communications for the Source Operations and Management Directorate.



Inset of Baghdad CitySphere™ data, showing imagery of Baghdad's best-known landmark—the giant crossed-sword arches built by Saddam Hussein after the Iran-Iraq War.

Photo ©DigitalGlobe

ENSURING THE MISSION

Aero Services' Pursuit of Quality Reaches Milestone

BY JAY EDMISTON

Life's biggest moments are documented with simple pieces of paper—a birth certificate, diploma, marriage license or retirement orders—a few words struggling to summarize much more. One of these moments took place in April 2007 when Air Force Col. John Schiavi, then NGA's Chief of Aeronautical Services (Aero), received a National Quality Assurance (NQA) Certificate of ISO 9001:2000 Registration during an International Organization for Standardization (ISO) awards ceremony.

The certificate symbolized a four-year journey of organizational introspective analysis, hard work and personal dedication.

"Successful certification under ISO standards validates Aeronautical Services' commitment to quality and ongoing efforts to create a more effective and efficient operation for our warfighting community," said Charles L. McGaugh, Director of the Office of Global Navigation.

ISO? Like on Trucks?

ISO is a network of national standards organizations from 157 countries working to develop technical agreements that provide a framework to ensure quality and consistency.

ISO registration is internationally recognized and indicates an organization is committed to quality. Companies tout this recognition by putting statements like "ISO 9001 Registered" on trucks, buildings, shipping containers, Web sites and many other places.

Enhanced Relationships

International acceptance is an important component of Aero's ISO efforts because aeronautical data is often acquired through exchange agreements.

Quality of data is also a huge concern for Aero as it relies on numerous countries for aeronautical information, using it to produce safety of navigation products for Department of Defense aviators worldwide. NGA's international partners also worry about quality, so obtaining ISO registration provides assurance that Aero is dedicated to meeting the same standards.

Aero has been undergoing a digital transformation effort for years and pushing others to do likewise. Various players in the aeronautical data arena include Jeppesen, the Federal Aviation Administration and others who have also been moving in this direction.

"We were pushing the rest of the world towards electronic/digital information, and reliable quality of information was going to be key to any future successes," said Lynne E. Puetz, NGA's Deputy West Senior Executive and former Aeronautical Division Chief.

As Aero began the pursuit of ISO certification, it became apparent that the goal was not just certification but rather the adoption of a different way of conducting business.

A major objective of ISO adoption was the standardization of production processes.

This was important to Aero as the sole producer of NGA's Flight Information Publications (FLIPs), precision navigation products that are critical to the safety of military flight operations. Using ISO standards offered an opportunity to enhance the quality of the production process and the products themselves.

Aero identified areas for improvement including the need to bridge the gap between newer analysts' abilities and experience lost during recent retirements. Training materials needed to be updated, according to the deputy division chief of the Aero Imagery and Obstructions Division.

"ISO was initially viewed as a mechanism whereby our training guidance and manuals could be reviewed and updated to make it easier for new analysts to use," she said.

Aero pursued standardization under the ISO 9001 series, which related to quality management and continual improvement of production processes. NGA's aeronautical products already followed a rigorous review process, while ISO helped define the overall management processes.

The tasks required to create, certify and maintain Aero's Quality Management System (QMS) include the following:

- » Defining a quality policy and objectives

- » Defining core processes and assigning ownership
- » Creating procedures and work instructions
- » Institutionalizing a philosophy of continual improvement
- » Instituting an audit program
- » Developing and maintaining records

People Power

People made this work for Aero, beginning with management, who spent hours defining the core processes that encompass production activities and identifying quality objectives that honored the mission and guided production.

The deputy division chief of the Aero Imagery and Obstructions Division served as management representative, a mentor helping her fellow managers through the adoption of ISO. Aero also has two full-time employees who handle ISO duties, including a Quality System Manager who acts as a focal point for development and maintenance of the QMS.

Aero employees began the work of writing step-by-step procedures for numerous business activities. During this process, employee contributions paid off because floor analysts were most familiar with the work required to create quality products.

The procedures were made available to the entire workforce for review. An analyst could then identify shortcomings and propose a solution to be reviewed and ultimately approved by the process owner, a manager who “owns” the core process covering a specific activity. Proposing a better way was encouraged anytime an analyst saw an opportunity for improvement. This continual effort to improve continues to be one of the core tenets of Aero’s QMS and its focus on quality.

The creation of work instructions was a demanding process that required rigorous review of numerous daily tasks, often leading to extensive discussions among managers. One useful tool for getting a work instruction correct was the flowchart, which helped define the course of a process or determine how a logical idea could use improvement.

The purpose for creating standardized procedures and work instructions was to use them to conduct normal, everyday business. To ensure instructions continue to work as intended, internal audits are conducted to verify compliance with the quality procedures and objectives.

NGA also conducted external audits to verify that certification efforts were on track and to initially certify the Aero QMS. Semiannual surveillance audits by NGA will also be required to maintain certification.

ISO also requires extensive documentation to clearly define the structure of the QMS, codify work processes, track audit results and detail subsequent efforts to improve. The task of organizing that documentation falls to Aero’s other full-time ISO expert, who manages a complex system of linked documents, folders and databases to meet ISO requirements.

Hard Work Equals Success

The hard work has been worth the payoff, with Aero achieving the goals it set early on and realizing a cultural change within the organization.

Standardization of production procedures has improved productivity due, in large part, to analyst involvement in capturing processes. The cultural shift is most evident within the ranks of Aero’s senior managers, who demonstrated their willingness to change and improve by referencing the quality-objectives framework in decision-making and planning sessions.

Aero tackled the ISO challenge, invested in a new philosophy and now reaps the results of its efforts. And now the department displays a piece of paper on the wall that reads simply “Certificate of Registration” but stands for much more. ▢

JAY EDMISTON

is an Aeronautical Analyst most recently serving as the Executive Officer to Aeronautical Services. A former military aviator and airline pilot, he is currently attending Air Command and Staff College at Maxwell Air Force Base, Ala.



One of numerous DOD Flight Information Publications.

ENSURING THE MISSION

NGA Delivers New Technologies to Bulgaria

BY BILL TRZYZEWSKI

NGA has been assisting the newly independent nations of Central and Eastern Europe in modernizing and expanding their geospatial intelligence (GEOINT) collection and exploitation capabilities and in achieving interoperability with NATO partners. For Bulgaria, NGA provided technical assistance and guidance to the Military Geographic Service (MGS), the primary GEOINT organization of the Bulgarian Ministry of Defense (MOD), to support data exchange and co-production.

Bulgaria identified as one of its top priorities a new printing capability, designed to replace its slow, antiquated 1970s-vintage printing press. Following consultations with the Sofia office of the U.S. Office of Defense Cooperation (ODC) and a review of pricing and availability data provided by NGA, Bulgaria decided to purchase and

install a new five-color, high-speed offset lithographic printing press and digital-to-plate pre-press system at the new MGS Production Center in Troyan.

One way that NGA helps partners achieve data interoperability and modernize their GEOINT production and exploitation capabilities is through the procurement of a wide variety of National System for Geospatial Intelligence hardware, software and services under the Department of Defense Foreign Military Sales (FMS) program. The NGA FMS team is composed of personnel from Acquisition Contracts, Acquisition Systems International Programs, Financial Management, the Office of General Counsel and the Office of International Affairs and Policy. The team manages all aspects of each FMS case in close coordination with ODC and the U.S. Defense Security Cooperation Agency (DSCA).



Commissioning ceremony for the new Military Geographic Service Production Center.
Courtesy of Bulgarian Military Geographic Service.

U.S. Foreign Military Financing grant money was used to establish an FMS case for the Bulgarian Ministry's printing press, including pre-press systems, training and GEOINT hardware and software.

In preparation for their new printing press, MGS built a new building on their Troyan campus. The building met stringent power supply, climate control and load-bearing requirements and was designed to house all MGS reproduction and product finishing systems.

As the printing press was manufactured by a non-U.S. company, Richard J. Millies, Deputy Director, DSCA, with the concurrence of the Department of State, gave permission for off-shore procurement. Installation began at the new facility in January 2007. A required site-acceptance test, overseen by representatives from MGS, NGA, ODC-Sofia and KBA, was successfully completed in March. The digital pre-press system was then delivered, installed, tested and accepted in April.

Colonel Georgi Gladkov, Chief of MGS, hosted a gala commissioning ceremony for the new Troyan Production Center on April 25, 2007. The Bulgarian Deputy Minister of Defense, Chief/Operations General Staff, Head of the National Border Guard Service, Head of the Bulgarian Publishers Association and Mayor of Troyan joined with the men and women of MGS to celebrate the grand opening. Representatives of the Archbishop of Sofia sang a benediction and blessed the attendees, the printing press and the new facility. NGA joined with Gladkov and Deputy Defence Minister Ivan Gavrilov in the ribbon-cutting ceremony. Young women in folk costume sang traditional songs of celebration as Gavrilov performed the ancient Bulgarian custom of dousing the floor with a pail of water to bring good luck to the new facility.

The new computer-to-plate press system provides MGS with the capability for quick, cost-effective press-run setup, applying data directly from a digital file to the press plate, thereby eliminating the need for expensive, environmentally hazardous chemical and film processes. The new high-speed press provides a print rate of over 15,000 copies per hour, making the MGS facility in Troyan the MOD's premier reproduction center.



Courtesy of Bulgarian Military Geographic Service.

Military Geographic Service (MGS) personnel demonstrate the new printing press and pre-press system at the MGS Production Center in Troyan.

Most recently, MGS provided GEOINT over joint U.S.-Bulgaria military training areas to support U.S. European Command requirements and high-resolution GEOINT over Sofia for NGA and the U.S. Country Team to support President Bush's June 2007 visit. MGS continues to be a good, close partner, providing hard-copy products, raster graphics, vector data, geodetic data and commercial imagery through the agreement with NGA.

Bulgarian armed forces personnel currently support the Multi-National Force-Iraq, NATO's Afghanistan International Security Assistance Force and the Kosovo Force, and provide force protection for Headquarters European Union Forces Sarajevo, the follow-on mission to NATO's Stabilization Force in Bosnia and Herzegovina. P

BILL TRYZEWSKI

is a Staff Officer for Central and Eastern Europe in the Office of International Affairs and Policy.



ENSURING THE MISSION

NGA Assumes DNI-Delegated Authorities

BY KATHERINE ZIMMERMAN

In April 2006, NGA began implementing critical disclosure and release (D&R) authorities related to geospatial intelligence (GEOINT) products, on behalf of the Director of National Intelligence (DNI). The assumption of these authorities has strengthened NGA's role as the Functional Manager of GEOINT and enabled the agency to improve timely and relevant support to foreign partners and Department of Defense (DoD) and Intelligence Community (IC) counterparts.

Strengthening NGA's Functional Management Role

At the time of NGA's (then the National Imagery and Mapping Agency) stand-up in 1996, key authorities for the disclosure and release of imagery and imagery-related products were delegated to the Director of the CIA. This continued a disparate D&R environment in which several IC agencies and organizations, including CIA, NGA and the IC-wide Remote Sensing Committee, all had a level of D&R authority and responsibility over some component of GEOINT, with no centralized authorities. In December 2005, after two years of close coordination between NGA and CIA, the DNI signed a memo transferring these authorities from the Director of the CIA to the Director of the NGA. This transfer not only benefited the IC at large by clearly identifying a central authority (NGA) for GEOINT D&R, but also marked a significant step toward furthering NGA's role as the Functional Manager of GEOINT by providing oversight authorities for imagery intelligence to the Director of the NGA, similar to the authorities the Director of the National Security Agency retains for signals intelligence and the Director of the CIA retains for human intelligence. In addition to codifying D&R oversight, the DNI-delegated authorities further enhanced the Director of NGA's ability to directly manage, develop and implement the agency's foreign relationships.

Impacting Our DoD, IC and Foreign Partners

NGA's Office of International Affairs and Policy, Disclosure and Release Division (OIPD) began preparing for NGA's assumption of these authorities in 2004, when the initial proposal was made to the then-Director of Central Intelligence George Tenet. The nature of these authorities



Mike McConnell, Director of National Intelligence

and their impact on defining the support the United States is able to provide its foreign partners requires NGA to actively collaborate and coordinate with the CIA, Defense Intelligence Agency, State Department and Foreign Denial and Deception Committee. This collaboration ensures that all relevant sources, methods and national equities are protected. OIPD recognized the importance of ensuring ease and efficiency in this IC coordination process and leveraged its role as the NGA focal point for these functions in order to proactively engage these organizations in identifying and implementing process improvements. The result was the design and development of the Imagery Disclosure Tool (IDT), an online application created to handle the submission, coordination and archiving of key D&R requests in support of U.S. government organizations, the IC and NGA's foreign partners.

When NGA assumed responsibility for the DNI-delegated authorities in April 2006, OIPD launched IDT to manage DoD and IC requests related to intelligence exchanges (including military-to-military), ongoing military operations, senior foreign official briefings, official diplomatic protests, and continuing authorizations. IDT centralizes processes and allows NGA and its IC partners a means for online collaboration and coordination in a transparent environment. With the implementation of IDT, OIPD created a collaborative coordination mechanism that

What Is D&R?

Disclosure refers to revealing classified or other sensitive government information—orally, in writing or using any other medium—without providing the recipient a copy of the information for retention. (They can see the information and hear it, but they can't keep it.) Release is providing the recipient a copy of such information—orally, in writing or using any other medium—for retention. (They can see it, hear it and keep it.)



simplified the IC review process, reduced e-mail traffic, enhanced request tracking, improved reporting and created a centralized online archive for searching and retrieving previous requests.

NGA's execution of these authorities has bolstered the Agency's ability to respond effectively to high-priority, time-sensitive issues and operations and has been favorable in the opinions of those NGA supports. According to the U.S. Central Command (USCENTCOM) Intelligence, "NGA OIP has continually provided time sensitive, real-time policy and GEOINT support to the USCENTCOM CCJ2. NGA OIP remains the most versed on GEOINT policies and procedures directly supporting the warfighter and has been instrumental in supporting real-time operations throughout USCENTCOM's Area of Responsibility." Similarly, the improved processes and procedures NGA has implemented have made a positive impact on the IC agencies closely involved in the process. As a coordinator from the State Department explains, "NGA has done a fantastic job managing its new disclosure authorities and repeatedly demonstrates itself as a competent arbiter and proactive responder to the needs of its D&R customers. Furthermore, NGA's IDT system is transparent, standard

across all IC elements, accessible, searchable and fast, and NGA has been willing to improve upon it to ensure it serves the customer."

Driving the Future of Disclosure and Release

NGA and OIP still move forward. Efforts on both the policy and technology fronts continue to ensure NGA is postured to respond to routine and crisis-related D&R requests. While the delegation of DNI authorities was a significant step toward solidifying and promoting the Director of NGA's role as the Functional Manager of GEOINT, OIP continues to actively collaborate with the DNI and Under Secretary of Defense for Intelligence to share effective policy guidance that better supports NGA's partners and the execution of the NGA mission.

Building upon the successful implementation of IDT, OIPD is actively working to define and implement requirements to automate a number of other key D&R processes, with the ultimate goal aimed at creating a Disclosure and Release Portal. This portal would provide users in NGA, DoD and the IC with a "one-stop shop" for policy guidance and decisions related to the disclosure and release of imagery-related NGA products. This resource will further enhance cross-collaboration and coordination among organizations and continue to strengthen NGA's ability to effectively and efficiently respond to requirements from our allies and coalition partners in support of worldwide humanitarian, disaster relief and Global War on Terror activities. [P](#)

KATHERINE ZIMMERMAN

is a contractor employee supporting the NGA Office of International Affairs and Policy (OIP). She has supported OIP's Disclosure and Release Division for the past seven years.





DRIVING TRANSFORMATION

FEATURE ARTICLES

- » Integrated Exploitation Capability Empowers Analysts Worldwide
- » Multiple Intelligence Disciplines Form a Clearer Picture
- » Joint Activities Accomplish Lasting Change Across NSG
- » Branch Creates Shapefile Tool to Simplify Work

DRIVING TRANSFORMATION

Integrated Exploitation Capability Empowers Analysts Worldwide

BY BRENT HERMANSEN

From humble beginnings, an NGA system is now becoming a common feature of geospatial intelligence (GEOINT) operations around the world. Since an initial delivery of 18 custom systems to the NGA Washington Navy Yard in 1998, the Integrated Exploitation Capability (IEC) has delivered over 3,000 workstations to analysts at over 110 sites worldwide. National intelligence centers, regional analysis centers, combatant commanders, battle planners, security event coordinators and natural disaster responders all receive support from GEOINT analysts equipped with the IEC, the worldwide workhorse. That massive success in less than 10 years begs the questions “What next?” and “Where else?”

The traditional model for development of an ultra-specialized workstation involves close control of the physical configuration and development process—delivering a well-defined capability within a reasonable period of time. As the IEC program matured, a new vision emerged for a streamlined acquisition process—a simple, user-friendly installation tool, and a realistic support concept, the Platform Independent Softcopy Exploitation Capability (PISCES).

“As the IEC program matured, a new vision emerged for a streamlined acquisition process—PISCES.”

Initially, the PISCES project explored whether NGA’s exploitation capability could be made available to a wider audience—customers who did not necessarily need a full-specification IEC workstation or could not justify the cost of a high-end workstation. Today, PISCES delivers a softcopy-only exploitation solution that can be customized to fit the specific needs of each customer via a highly automated installation tool. It breaks away from the one-size-fits-all mentality.

Through PISCES, exploitation capabilities are installed in a user-friendly, automated manner on a range of workstation platforms and network configurations, including workstations not connected to a network infrastructure.

The automated installation process senses, through queries to the computer system, the configuration of the host computer. It determines, with input from the user, exactly what capabilities the user really wants. For example, if a user only needs the capability to measure objects seen monoscopically on commercial imagery, the PISCES tool notes the host configuration and installs only the software necessary and appropriate to do the function on that particular computer.

Not limited to users with a limited exploitation mission, PISCES is also capable of installing a full-specification IEC capability on a high-performance workstation remotely. It improves the efficiency and timeliness of ordering, receiving and installing exploitation applications on workstations in National System for Geospatial Intelligence (NSG) and standalone environments.

Never content to rest on past successes such as PISCES, the IEC program continues to keep pace with current technologies such as the following:

- » Piloting efforts to deploy onto Microsoft’s Vista Operating System and associated tools
- » Optimizing the transmission rates on networks (i.e., faster response for users)
- » Minimizing conflicts between different software versions.

As a practical matter, the IEC is now in the sunset of its lifecycle. It remains the fine-tuned engine driving the NGA (and NSG) GEOINT machine. As NGA moves to a service-oriented architecture, the services-based design and approach of the IEC will live on, serving not only as the exploitation foundation of that architecture, but also as an integration model for future systems. P

BRENT HERMANSEN

has had a lifetime career supporting the Intelligence Community. He is currently Chief Executive Officer of a private firm that provides systems analysis and technical support to NGA.





DRIVING TRANSFORMATION

Multiple Intelligence Disciplines Form a Clearer Picture

BY SABINE PONTIOUS

Over the last year, NGA has achieved dramatic success in leveraging other intelligence disciplines (INTs) to provide more comprehensive geospatial intelligence (GEOINT) answers. The Agency has long enjoyed a productive relationship with the National Security Agency in efforts to jointly employ the nation's "eyes and ears" against U.S. adversaries. Building on this success, inter-agency collaboration has reached new heights in preparing for and responding to the most dangerous—and best-concealed—threats.

A true milestone in interagency collaboration was recently achieved with the ability of military and intelligence organizations to see inside each others' technical collection strategies, and then jointly acquire intelligence data against a target. These coordinated efforts compounded the strengths of the various intelligence disciplines for a deeper understanding of U.S. adversaries' activities, resulting in a more efficient application of the U.S. intelligence assets. For example, sometimes a GEOINT

question is answered best by another intelligence discipline's systems or processes.

Responsiveness and seamless integration go a step further with the multi-intelligence collection model called Integrated Collection Management. This process is a highly synchronized application of prearranged collaborative collection strategies among two or more intelligence disciplines. Originally a signals-intelligence and imagery-intelligence initiative, it now incorporates multiple disciplines, platforms, sensors and Intelligence Community partners. Certain predictable international scenarios initiate intelligence gathering through deliberate parsing and allocation of IC assets—like a complex arrangement of falling dominoes. For example, timely human intelligence and commercial or airborne imagery are capable of revealing physical details of places or events with unprecedented clarity, effectively redefining the limits of GEOINT. In 2007, NGA developed collaborative collection strategies at record levels.



U.S. Air Force photo by Tech. Sgt. Maria J. Bare



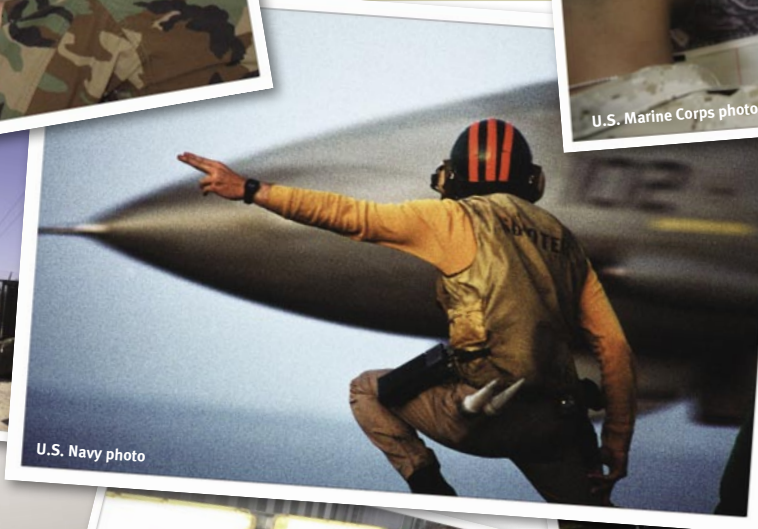
U.S. Navy photo



U.S. Marine Corps photo



Photo by Larry Franklin



U.S. Navy photo

Multi-INT draws from many sources.



U.S. Army photo



U.S. Air Force photo



U.S. Air Force photo by Tech. Sgt. Adam M. Stump

When Director of National Intelligence Mike McConnell issued his 500 Day Integration and Collaboration Plan, he made it clear that the IC must rapidly overcome those invisible barriers that impede coordination and collaboration and that undermine the production and dissemination of timely, relevant intelligence. In 2007, in addition to the closer cooperation already described, NGA made great strides toward that vision by doing the following:

- » Creating new working groups dedicated to multi-INT operations and community collaboration.
- » Sponsoring multi-INT training to promote collaborative methods and practices.
- » Sharing expertise through employee assignments to mission partners to promote closer working relationships, tighter coordination and better analysis.
- » Developing new tools, technologies and tradecraft to bridge gaps between disciplines and make collaboration more transparent.
- » Crafting new procedures in tasking, collection, processing, dissemination, archiving and analysis to make GEOINT more accessible to other disciplines and to provide NGA's workforce access to data from other INTs.

» Developing creative multi-INT strategies to augment GEOINT collection capabilities in the U.S. government, civil, commercial and international sectors.

Some of the barriers to effective collaboration across the IC will undoubtedly linger. NGA, however, has emerged as an IC leader, coordinating systems and strategies to collect intelligence for the most thorough answers possible to questions having worldwide ramifications. GEOINT alone cannot paint as complete a picture as several INTs combined. Considering the unlimited layers of information and nuance that multi-INT collaboration can produce, it truly illustrates the notion that the whole is greater than the sum of its parts. **P**

SABINE PONTIOUS

is a contractor supporting communications for the Source Operations and Management Directorate.



DRIVING TRANSFORMATION

Joint Activities Accomplish Lasting Change Across NSG

BY DAVID KETRON

NSA integrated geospatial intelligence (GEOINT) into joint doctrine through a number of new joint publications last year. In its functional management of the National System for Geospatial Intelligence (NSG), the Agency also issued a series of NSG Directives outlining roles and responsibilities for NSG functional managers. Meanwhile, NSA continued to focus on improving the application of GEOINT to a wide range of operations conducted by NSG partners.

One NSG partner—U.S. Joint Forces Command (JFCOM)—continued to co-lead the Joint Geospatial Intelligence Activity (JGA), which has applied broad criteria in identifying gaps and proposing actions to enhance joint capabilities.

By working together, mission partners can realize immediate low-impact enhancements by identifying best practices and aligning activities with the technology that combatant commanders, operators and analysts already use.

Specific actions focused on the execution of joint doctrine and the transformation of GEOINT capabilities and procedures to achieve “jointness.” For example, JGA funded joint enhancements to the Air Force Geospatial Product Library and U.S. Pacific Command Theater Geospatial Database to better meet joint warfighter needs.

JGA also established a Joint Warfighter Interoperable GEOINT Concept of Operations that identifies a consistent joint GEOINT process and outlines the GEOINT cell concept that was introduced in joint publications. Recommended actions apply to doctrine, organization, training, materiel, leadership, personnel and facilities, collectively known as DOTMLPF. They are captured in NSA’s JGA Strategic Implementation Plan and a draft JFCOM document, Joint GEOINT Transformation DOTMLPF Change Recommendation.

JGA’s true success can only be measured as plans and recommendations are executed. Strong collaboration among NSG partners is essential. Immediate benefits will be realized from actions that develop and exercise the GEOINT cell concept at the joint operational and tactical level. Such actions will also institute lasting change across the NSG, as they expand options for sharing information and enable unified operations. **P**

DAVID KETRON

is an NSA staff officer in the Office of Geospatial Intelligence Management serving as the Operations Manager for the Joint GEOINT Activity.



Immediate benefits from the Joint Geospatial Activity will be realized from actions that develop and exercise the GEOINT cell concept at the joint operational and tactical level.

DRIVING TRANSFORMATION

Branch Creates Shapefile Tool to Simplify Work

BY KEVIN WITHEROW AND ROGER MAIER

It's an all-too-common scenario:

technology is upgraded in hopes of yielding more powerful software applications. Yet, the price seems to be the loss of user familiarity and efficiency. One instance occurred recently with software used in NGA's geospatial-analysis tasks.

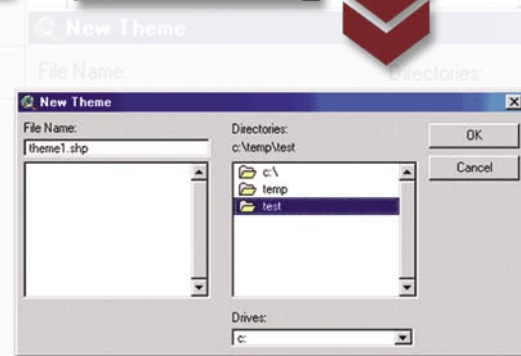
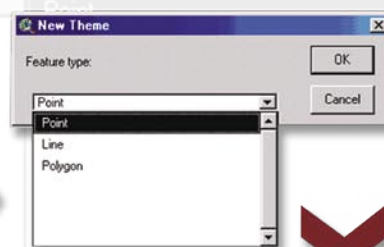
In the late 1990s, analysts used a common application for geospatial analysis that became standard for the desktop geographic information system (GIS). But this product was updated in recent years with a suite of products, or applications, that ushered in a new way for users to perform geospatial analysis.

The new package offered significant new features, functionality, extensions, greater flexibility and capabilities not available with the original application. But for many, the transition was difficult, so much so that a sizeable number of users continued to use the original application.

The analysts found difficulty with the new package for several reasons. These included an inability to transfer their preferences from the original application to the new suite of products, a loss of functionality resulting from the transition, interface changes, and the need to use different applications in the new suite of products simultaneously to perform certain tasks.

A particularly illustrative example of the lost functionality was the inability to create shapefiles within a single application. Shapefiles provide a format for displaying geospatial data that allows it to be viewed and edited on a GIS. Users could create shapefiles very simply in the original application, but in the new package, they had to switch between different applications contained within the suite of products. First, a new shapefile had to be created in one of the applications. Then, to add features to the shapefile, the user had to load it into a different application and start an editing session.

While many analysts were satisfied continuing to use the original application, members of the Geospatial Intelligence Custom Applications Branch realized that the future lies with the new package. Befitting the name of the



A common application used for geospatial analysis, referenced in the above illustration, had many advantages that NGA incorporated into a tool called Easy Shapefile Creator.

branch, they designed a custom solution—Easy Shapefile Creator—that incorporates the simple functionality of creating a shapefile in the original application into the new package, avoiding the necessity of interfacing between two different applications.

Easy Shapefile Creator allows analysts to both create and generate a new shapefile in just one of the applications that make up the new GIS package. It is one example of how innovative thinking in NGA can incorporate human-needs engineering in order to customize technology and make it more useful and efficient. **P**

KEVIN WITHEROW AND ROGER MAIER

work in the Geospatial Intelligence Customer Applications Branch. Kevin Witherow develops geographic information system software, and Roger Maier leads the Geographic Information Systems Development Team.





LOOKING AHEAD

U.S. Air Force photo

FEATURE ARTICLES

- » An Important Technology Passes: New Displays Will Replace Cathode-Ray Tube
- » WorldView-1 Delivers New Capability
- » NSG Adds Weather Data, Moves Toward Net-Centric Warfare
- » eGEOINT Will Help NGA Become More Service-Oriented

U.S. Navy photo



LOOKING AHEAD

An Important Technology Passes New Displays Will Replace Cathode-Ray Tube

BY DR. RONALD E. ENSTROM

In geospatial intelligence (GEOINT) analysis work, where subtle changes or minute details may be critical, seeing truly is believing. To aid in believing, NGA analysts currently use high-quality, high-resolution cathode-ray tube (CRT) monitors to display imagery, geospatial data, graphics and other key elements in their work. As the last major application of vacuum tube technology, developed in the 1940s, CRT technology is rapidly approaching its end life.

For the last several years, the supply of high-quality CRT monitors has dwindled as manufacturers have increasingly shifted production to the flat-panel displays favored in offices and homes. Early NGA testing suggested that these technologies had substantial disadvantages compared with the CRT standard. GEOINT analysts' need for specialized monitors is viewed as a tiny market niche. As a result, NGA's last source for high-quality CRTs is dropping the monitor from its line.

NGA is now facing the end of an era and the disappearance of CRT technology from the workplace, a day when a monitor "dies" and cannot be replaced by an equivalent from stock shelves. Unfortunately, no obvious replacement has emerged. Rather, new technologies with unique potential are being brought to market.

Because GEOINT analysts have requirements that are considerably more stringent than the requirements of possibly every other display user, NGA must drive the development of available, emerging technologies. To meet the specialized needs of analysts, one high-potential technology requires them to keep their heads in the optimum viewing position for extended periods of time—no small demand.

To assess the potential of the various emerging technologies, a CRT Replacement Team organized evaluation sessions, engaging more than 200 NGA analysts. The viewing environment was set to approximate NGA



facility standards for analyst viewing, and displays were calibrated to comply with standards established by the NGA Image Quality and Utility office. Workstations were equipped with RemoteView™ and Socet Set® electronic light table software to standardize image viewing and manipulation. Analysts could use the images provided or access images from their usual work files. They rated each of 11 displays on technical and human factors and stated whether the display could be a viable replacement for their current CRT display.

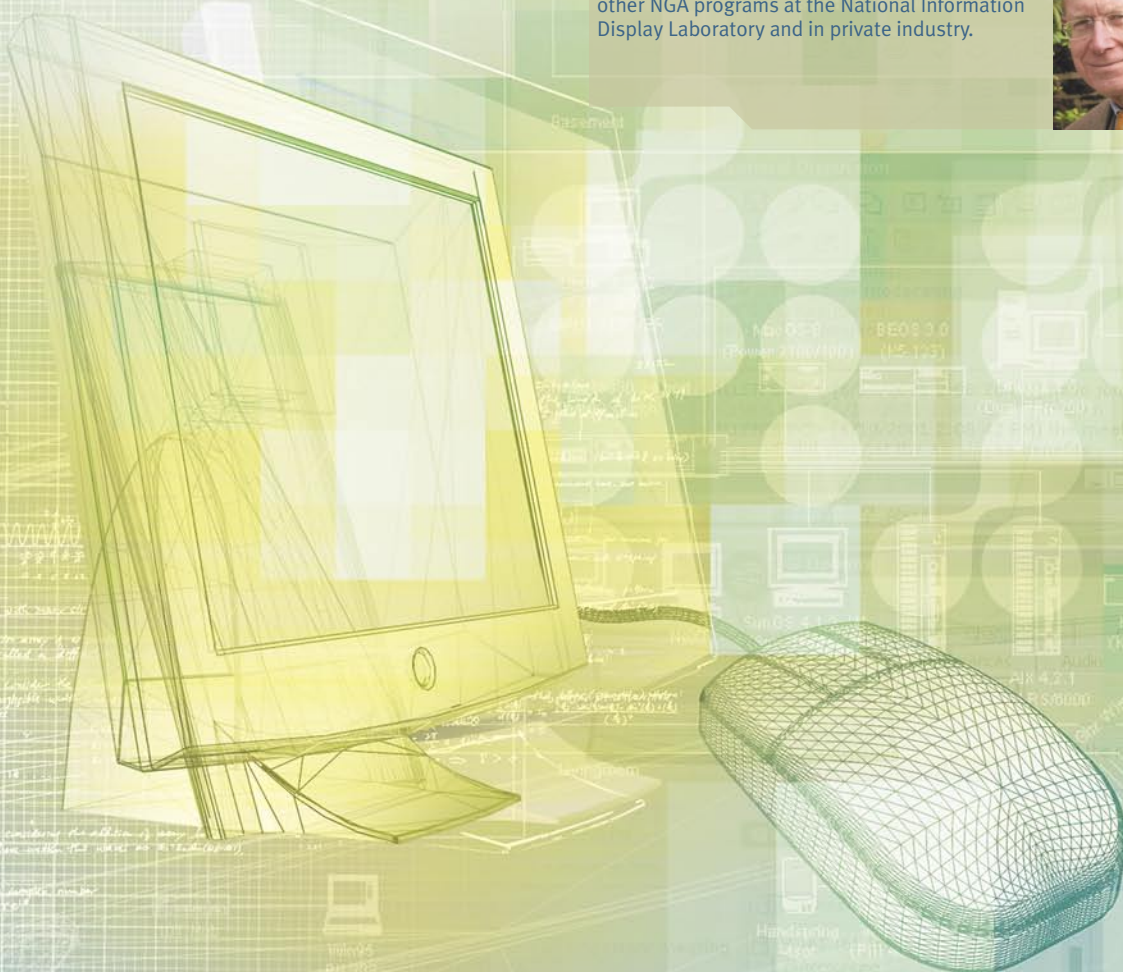
The displays included fast liquid-crystal displays that could approximate the roam speed of a CRT, stereo displays that equaled or exceeded the resolution of the CRT displays, and eyewear that could be worn on the head or mounted on a tripod to view a scene in stereovision, when required. The analysts found that certain displays

performed a particular technical function very well, while other displays appealed because the analysts could assume a comfortable viewing position for an extended period of time.

Finding a replacement for the CRT display is a continuing process of which the analyst evaluation is a critical step. The CRT Replacement Team is encouraged by results to date suggesting that suitable replacements for the CRT technology are on their way. Next steps will include close engagement with technology producers, giving feedback on analyst needs, and focusing attention on the technologies with the highest potential to meet NGA requirements. The end result will be improvements to existing, image-viewing technologies, bringing them in line with the needs of GEOINT professionals. **P**

DR. RONALD E. ENSTROM

led programs to find and certify displays for the Integrated Exploitation Capability and other NGA programs at the National Information Display Laboratory and in private industry.



LOOKING AHEAD

WorldView-1 Delivers New Capability

BY CYNDI WRIGHT

On Sept. 18, 2007, the Intelligence Community witnessed the launch of the first NextView class commercial imaging satellite. The DigitalGlobe WorldView-1 (WV-1) spacecraft is in orbit, its sensor sending very high-resolution imagery to a ground architecture built to NextView Program standards. That imagery is now on its way to NGA libraries via high-speed electronic links.

NextView represents a quantum leap in the capabilities of U.S. space-based commercial remote sensing, including:

- » Very high resolution—.5 meter—imagery
- » Stunning improvements in geolocation accuracy
- » Dramatic changes in sensor agility (a first-ever commercial application of Control-Moment Gyros allows quick sensor focus on divergent targets)
- » Tasking-to-delivery time in the neighborhood of 800 minutes for routine orders
- » High-speed, electronic transmission of imagery data
- » Increase in overall collection capacity in the vicinity of 50 percent, capable of gathering 400,000 square kilometers of 80 percent cloud-free imagery daily, with revisits in less than 48 hours.

Easy-to-use Imagery

For years, U.S. warfighters have sought readily available, high-quality, unclassified imagery and related products in a format they could easily use and disseminate. The NextView Program delivers on the NGA promise in a be-careful-what-you-wish-for manner, delivering immense amounts of high-quality imagery to NGA (and on to users) in volumes that stretch our already-burgeoning libraries and data links.

With well-established license agreements already in place, U.S. warfighters can readily share commercial imagery with coalition partners for counterproliferation, counterterrorism, and damage assessment, thereby expanding the military's concept of intelligence collaboration beyond national borders. Because of its unclassified nature, high-resolution commercial imagery also supports a wide variety of other missions and customers, such as agricultural and environmental applications and humanitarian and disaster relief efforts.

Commercial remote sensing data is a valuable resource in its application for geospatial and imagery analysis. In addition to exploitation by NGA personnel using the National System for Geospatial Intelligence, commercial imagery can be easily ingested into various commercial off-the-shelf (COTS) software suites for exploitation and manipulation. Currently, a number of NGA products are being generated from commercial imagery, including HarborView, CitySphere™ Controlled Image Base (CIB®), mono and stereo airfields.

Four Commercial Satellites Planned

The second NextView Program launch (GeoEye-1 satellite, to be delivered by GeoEye), on a similarly fast timeline, is scheduled for spring 2008. GeoEye will add a multispectral capability to the program while meeting the NextView requirements for resolution, accuracy, delivery time and transmission speed. DigitalGlobe is also developing the WorldView-2 (WV-2) satellite, with a planned launch in 2009. GeoEye recently announced their plans for GeoEye-2, a .25-meter ground resolution, slated for a 2011 launch.

The geospatial intelligence community will benefit tremendously from the launch of these four spacecraft, all designed and built with specifications to support our customers with the most stringent performance parameters for image quality, accuracy and timeliness. NGA is proud of this unprecedented partnership with the commercial remote sensing industry and looks forward to a long, productive relationship. P

CYNDI WRIGHT

is the NextView Program Manager in the Commercial Solutions Division of the Acquisition Directorate, responsible for the two NextView Programs for next generation commercial imagery.

View of Paris, France from DigitalGlobe's WorldView-1 satellite.
Photo ©DigitalGlobe

LOOKING AHEAD

NSG Adds Weather Data, Moves Toward Net-Centric Warfare

BY KAREN RUPPE

NSG's Office of Future Warfare Systems interacts with Department of Defense program managers to ensure that issues involving geospatial intelligence (GEOINT) are considered throughout systems development.

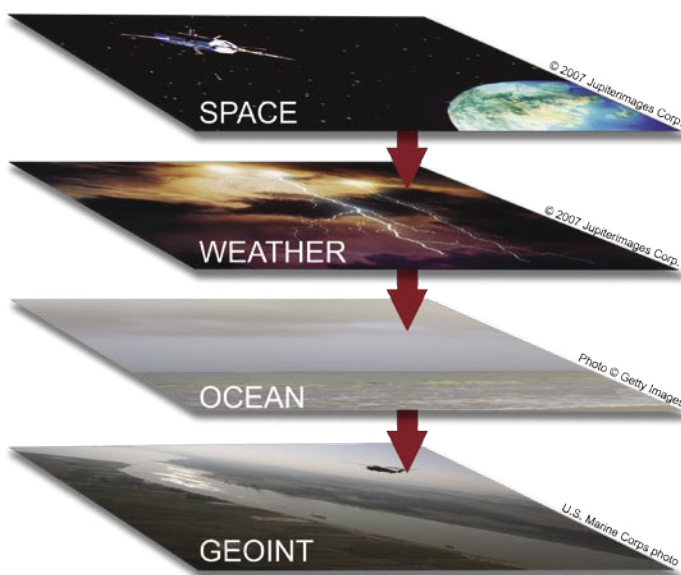
Significant achievements occurred on the weather front in 2007, among other areas. NSG established the position of Senior Meteorological and Oceanographic (METOC) Officer within the Office of Future Warfare Systems (OMW) to coordinate environmental issues for the National System for Geospatial Intelligence (NSG). In coordination with the Agency's key components, the officer has received approval from the NSG Director to establish a METOC Management Authority. The Management Authority will draft a Weather Strategic Implementation Plan to address the broad, cross-cutting effects that space, atmosphere and ocean have on the production of GEOINT. The plan will identify necessary actions and resources to address the integration of weather and environmental concerns into NSG mission areas. Publication of the plan is expected in 2008.

In addition, NSG established an NSG-wide group to deliver technical solutions to environmental challenges that impact GEOINT production. Called the Meteorological and Environmental Pathways to/from the Intelligence Community, the group was formed through a collaboration of OMW, the InnoVision Directorate and the NSG Technical Executive. InnoVision is chairing the group.

In collaboration with the Air Force Weather Agency at Offutt Air Force Base, Neb., OMW also developed an overlay of environmental data for NSG's Palanterra™ software package, used for homeland security and other applications. Introducing the overlay to Palanterra™ has set the stage for incorporation of environmental data into NSG's Google Earth™, providing worldwide support.

Future Combat Systems

OMW continued to support Future Combat Systems (FCS), the Army's modernization program in 2007. In order to ensure interoperability, the Army has aligned with the NSG and formalized the need for a common geospatial Logical Data Model (LDM) for use in the development of FCS. OMW coordinated across NSG key components to relate significant dependencies of FCS on a geospatial LDM, including its timely development and implementation.



OMW spearheaded several Data Model Summits and worked closely with FCS program developers. One outcome was a geospatial LDM that NSG provided for the first FCS battle-command software build. FCS is the first system in development to incorporate the new data model, which will facilitate the collection of value-added data from the field and exchanges of GEOINT.

Advances in the development of Net-Centric Enterprise Services (NCES) are coming in 2008, in particular the NCES Global Information Grid, one of the key systems driving interoperability. NCES will be the backbone for making sure that the NSG community can access, understand, disseminate and use data from multiple sources. It will provide the conduit for passing and receiving data to and from the warfighter. NSG has partnered with the Defense Information Systems Agency to develop this important capability. **P**

KAREN RUPPE
is the Functional Executive of the Office of Future Warfare Systems.



LOOKING AHEAD

eGEOINT Will Help NGA Become More Service-Oriented

BY GARY W. FULLER

Through the efforts of the eGEOINT Management Office, NGA is transforming itself to being a GEOINT Services Provider to better serve its partners, customers, consumers and users. To do this, eGEOINT is considering GEOINT as Services (GAS) as a key element of enabling GEOINT. This transformation addresses changes from both a business and technology perspective and includes people, process, technology and physical infrastructure dimensions.

As part of this transformation, GEOINT Online (GO) will provide an integrated, intuitive user interface to GEOINT discovery and access services in late 2008 as a first step to a true online, on-demand geodata, information and knowledge service. Later versions of GO will create the foundation for a Global GEOINT Network (GGN), enabling a global community of GEOINT providers and users who share content, services, expertise and support.

The first version of GO will be mostly based on technology integration, but its ultimate success will depend on business process transformation across NGA to support the services provider model. In other words, the way NGA does business will be driven by providing services rather than producing products.

To do this, NGA is developing a services doctrine and concept of operations that define how the Agency will operate in a services environment. A fundamental element of this transformation is to promote a services orientation in all activities, whether business or information technology services. It is, in effect, a way of thinking about what NGA does and how it does it, focusing on customer satisfaction.

At the technological level, defining and implementing a services-oriented enterprise architecture, driven by the needs of the business and serving customers, will be another key step forward. The construct of GAS is key to the success of GO and NGA's transformation. ■

GARY W. FULLER

is a Senior System Engineer and Strategic Planner with an NGA contractor supporting the eGEOINT management office.



eGEOINT

PARTNERSHIPS

NGA Brings GEOINT to Navy Deployers

BY JOHN GRAY

The Navy NGA Support Team (NST) is taking an active role in exposing the fleet to NGA by demonstrating Agency products and services to our deploying naval forces where they work and train. Navy leaders are becoming increasingly aware that timely, relevant and accurate geospatial intelligence (GEOINT) gives decision-makers and mission planners a keen operational advantage over potential adversaries. But, as GEOINT products and services become more complex, their effective utilization requires increased knowledge of the various data exploitation and display methods available. That's where the Navy NST brings together a group of individuals with diverse naval warfare experiences and skill sets to train and equip Navy operational commands and support staffs with the latest in GEOINT tactics, techniques and procedures.

Partnership with the Fleet

NGA has an externally assigned geospatial analyst at the Naval Strike and Air Warfare Center (NSAWC), who from this remote desert training facility provides tailored GEOINT support to a broad range of mission partners. Whether they are conducting predeployment training or real-world combat operations, highly dispersed Navy warfighters have access to the specific planning and targeting they need to complete their mission. Rapid advances in geographic information system (GIS) software and improved imagery capabilities, along with the deployment of geospatial visualization tools (Google Earth™ ArcGIS Explorer™, Palanterra™) to user networks, have enabled this improved access.

The increasingly expeditionary nature of naval warfare requires the ability to rapidly produce mission-specific data and products for new and, at times, hard-to-access locations around the globe. Exposing Navy intelligence and operations specialists to new and improved GEOINT access and exploitation capabilities enables them to decrease their search time for resources and spend more time performing GEOINT analysis and production. Future advancements such as the migration to a Web-enabled, net-centric dissemination architecture will continue to improve the quality and completeness of NGA support to the deployed warfighter.

Impact of Training

Exposing operators to NGA systems, products and reach back resources prior to deployment better enables them to plan and execute the GEOINT-dependent portion of their missions regardless of the operating environment. The Navy NST is committed to providing on site tailored GEOINT training to each deploying Carrier/Expeditionary Strike Group. This training includes basic geospatial analysis, geodesy and datums, NGA products and services, GEOINT support to strike warfare and GEOINT visualization services. Advanced training includes applications of GEOINT to complex strike warfare scenarios and Intelligence Preparation of the Environment.

Making a Difference

Site visits to deploying warships and aviation units have provided an excellent opportunity to enhance the understanding of GEOINT as it applies to strike warfare. There is no substitute for being able to demonstrate all that NGA has to offer the warfighter and no better feeling of accomplishment than seeing Navy units actually create their own GEOINT using the equipment they will be deployed with. P

JOHN GRAY

is a geospatial analyst and an NGA Staff Officer assigned to the Naval Strike and Air Warfare Center. A retired Navy chief warrant officer, he has supported the Intelligence Community for over 24 years.



U.S. Navy photo

WORKING FOR NGA

Staff Officer Creates New Relationship with DEA

BY LAUREN NEWSON

On Aug. 31, John Godby, a Staff Officer with the U.S.

Marine Corps NGA Support Team (NST), taught a course for the Drug Enforcement Administration (DEA) Training Academy in Quantico, Va. The academy wanted Godby to teach their entry-level analysts basic map-reading skills.

In preparation for the course, Godby used NGA resources including materials from the School of Geospatial Intelligence, as well as materials from the Marine Corps Basic School and U.S. Geological Survey (USGS), while drawing from personal experience to develop a course that addressed the fundamentals of map reading. Godby's goal for the one-hour course was for the students to understand map basics like features and coordinates. To achieve this, he ordered 30 sets of "JOG- Airs" (Joint Operations Graphics-Air, 1:250,000 scale), 30 "TLMs" (Topographic Line Maps, 1:50,000 scale) and 30 USGS maps (1:24,000 scale), all covering the DEA Training Academy and surrounding area.

The course covered the interpretation of marginalia, symbols and features. Godby had the students look for quarries, depressions, draws, fingers and saddles. They also explored how to measure distances and slope interpretation (whether the slopes are concave, convex or uniform).

"The class was very interactive and hands-on, which generated a great deal of interest and enthusiasm amongst the students," Godby said. He also touched on how to properly use the Global Positioning System (GPS) and the dangers of using incorrect data. In addition, Godby used different datums in an effort to teach the students that the world has different datum sets and that they must match between the maps and GPS.

This class was a new collaboration between NGA and DEA. "The future of the class is promising due to the networking and collaboration that has occurred," Godby said. "It's important to greet people and let them know who you are. That's how I get most referrals."

Godby shares the credit for the class' success with the School of Geospatial Intelligence, Marine Corps and USGS. Teaching is nothing new to Godby, who has been a Sunday school teacher, a youth sports coach and a Marine Corps flight instructor. "You have to know your audience and what the objectives of the class are," he said. "If it is fun for the students, the information will stick with them."



As a member of the Marine NST, Godby travels around "selling" NGA to Marine Corps commands at Quantico. His primary focus is with the Marine Corps Training and Education Command. Godby is quick to point out that everything NGA has accomplished at Quantico has truly been because of great teamwork across NGA and with other agencies. ▢

LAUREN NEWSON

was an intern in the Office of Corporate Relations. She currently serves as Editor in the Director's Action Center.



OUR HERITAGE

You Are What You Read!

BY DR. GARY E. WEIR

You are what you read, so let the NGA History Group improve your intellectual diet! The history of intelligence and geospatial tradecraft illuminates a world many never see. For others it provides the context of their professional lives. In my case, the world described by Alfred Burton in *Conquerors of the Airways* or by Elie Abel on the Cuban Missile Crisis provides an important backdrop for all of us who matured in the shadow of the Cold War. Regardless of age or life experience, history offers even deeper understanding for the experienced, while it enables the young to mature beyond their years.

For centuries, successful people have made reading history a habit. Understanding the past to inform the present, what we call applied history, became part of a daily routine for Winston Churchill, George Patton, Bernard Montgomery, John Kennedy, Dwight Eisenhower, Napoleon Bonaparte, Chester Nimitz, Hyman Rickover and many who became extraordinary. I became very good friends with a remarkable Navy vice admiral who spent his lunch hour two or three days each week reading history and helping to catalog historical manuscripts at the Navy Department Library while serving as Commander, Submarine Force, U.S. Atlantic Fleet. He "owned" all of the submarines in the Atlantic Fleet as well as those in NATO. History, he suggested, helped him relax and gave him broad perspective. I need this, don't you?


At the end of 2007, the NGA history group scrapped the old history Web page on NGA's internal networks and created a home in our workplace for things interesting, diverse and historical. This page, already on Agency networks, is scheduled to appear on our public Web site, www.nga.mil, in January. One of the departments on this page contains the first edition of a reading list in history for anyone fascinated by geospatial intelligence (GEOINT), its practice and evolution. Looking at the list, you might mumble that the historian has lost his mind, or perhaps envision a package of books in shrink-wrap prescribed for everyone who wishes either to advance as a professional or to understand this type of intelligence. Thankfully, the truth lies elsewhere.

The NGA history staff would like to suggest a different way of using this list, a way that will help us fulfill one of our many historical goals for this past year. We prepared the list for the widest possible audience, comprising the worldwide GEOINT community and all those wanting to know more about GEOINT. For those in the National System

for Geospatial Intelligence, it offers as much as possible for every analytical trade and interested staff member. Well-written history entertains while inviting us to ask questions of our assumptions based upon the way colleagues from our past wrestled with the essential questions of their time and their practice.

In using this list, please choose works that you like. Nothing here should suggest requirement. Choose something new or choose something you have already read. The new offers novel possibilities; the familiar history will reward you once again, and your enthusiasm for it will reveal satisfying nuggets you missed earlier. Read at your desk if time permits, in a comfortable chair with a glass of wine at home, just before bed, or with friends in a study group. I would enjoy hosting a history reading group at NGA headquarters in the east if that proves desirable. In the west, the museum staff will play host to a group if that serves. Each book or article, each moment you spend with well-crafted history, advances you as a professional.

Not everyone will choose the same kind of history. Perhaps you would prefer a biography of Constance Babington Smith, or a memoir of a critical time in our history written by Dino Brugioni, or Robert Divine's fine history of President Eisenhower's reaction to the Sputnik launch in 1957. The more you read and the more you revisit old historical friends, the deeper you become as a professional. The more you know, the more historical you are, the greater your ability to see both the way people react to critical moments in our national life and the significant continuity between our present activity and that of our colleagues decades and even centuries ago.

Our list will remain in constant revision, adding works that you may nominate to me at Gary.E.Weir@nga.mil and refining the existing choices made by the history staff. You will not find the latest headlines in a work of history. However, the latter will offer something far more fascinating: real lives like our own and the origins of what we do. 

DR. GARY E. WEIR
is the NGA Historian.



VIEWPOINT

Collaboration Requires Knowing Rules of the Road

BY TOM COOKE

When intelligence professionals discuss analysis and production, the conversation often turns to the issue of “lanes in the road.” The phrase is applied both positively, as in “They know (or keep to) their lane,” and negatively, as in, “They don’t stay in their lane.” Regardless of how the term is applied, it is invariably based on defining specific tasks for Intelligence Community (IC) members. For example, when all-source analysts comment on imagery products, imagery analysts may object. Conversely, when imagery analysts offer opinions on a potential adversary’s military intentions in addition to their capabilities, all-source analysts similarly express concern.

Because these “lanes” are often cited as a hindrance to true IC collaboration, I thought it might be useful to fully explore this traffic metaphor and how it may be positively applied.

When discussing lanes in the road, it is important to remember that it’s all the same road. Assuming we are talking about a multi-lane highway, all the lanes travel in the same direction and, therefore, head toward the same destination. The same is true of the IC. Regardless of the lane, everyone is traveling in the same direction toward the same goal.

No lane is more important than another. Trucks may keep to the right and faster traffic will normally dominate the left lane, but each lane is equally important based on the traffic it supports. When driving on a multi-lane highway, usually there is no law against occasionally changing lanes, even if lumbering trucks occasionally move toward the center to get around an obstruction. The same rules apply within the IC. Although some organizations normally “stay in the right lane,” at times they need to “move out of their lane.”

In normal traffic, when a vehicle successfully moves from one lane to the other, three actions must occur to maintain order. First, the vehicle changing lanes looks to ensure no other vehicle is occupying the space into which it wishes to move. Second, the vehicle makes its intent known through a clearly visible signal. Third, all other vehicles on the highway should recognize and acknowl-

edge the intent of the vehicle to change lanes and make sufficient allowance to let it into the lane. If any of these actions does not occur, the results can cause a crash, forcing everyone on the highway to stop until the debris are cleared.

These actions are also relevant to the IC. When an IC member determines an operational requirement to “change lanes,” all three actions must occur. For example, when an organization identifies a need to operate outside its normal analysis and production effort, it should first look throughout the IC to determine whether others are performing the intended effort. By querying the IC, it not only reduces the possibility of costly and unnecessary redundancy, it also performs the second step: signaling intent. If it is clear no one is performing the task, the IC member must make its intention known to fill that void. Once these two functions are complete, the entire community needs to allow sufficient room.

Applying our traffic analogy to an IC-centric conclusion, crashes (and resultant backups) occur when (1) an IC member decides to change lanes independently, (2) the member does not coordinate (signal) to others who might be performing a similar mission, and (3) other members intentionally try to stop the action, just like a driver who sees someone trying to change lanes and then speeds up to fill the gap.

So, the next time you hear someone talking about “lanes in the road,” remember it’s OK to sometimes change lanes, as long as you follow the rules. **P**

TOM COOKE

is Deputy Director of the Defense Intelligence Agency NGA Support Team. He is a retired Army lieutenant colonel with over 28 years’ intelligence experience.



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NEW CAMPUS EAST

NGA's New Home Is a Symbol of the Future


BY DR. EILEEN M. PREISSER

The New Campus East (NCE) is a physical symbol of NGA's transformation as it focuses on further improving the quality of both products and services to its partners. NGA is crafting its legacy for the future with every decision made and implemented with respect to the NCE.

During 2007, remediation and cleanup on the land parcel was completed and construction began on the site. NGA also surmounted several obstacles along the way, engaging worried Fairfax County neighbors in dialogue to ease their concerns. The agency also received most of the environmental permits, although they were more complicated to get than initially thought. Happily, NGA also discovered two endangered species on the site that made it a treasure: the small whorled pogonia plant and wood turtle. This summer, NGA finalized road construction scenarios with the Virginia Department of Transportation and the Army and made significant progress regarding decisions concerning who will fund power, utilities, bridges, and roads. NGA celebrated the completion of the 10-percent and 35-percent designs, hired the first construction management contractors, and created a "One Team" partnership with the joint venture partners from the Army. The 2.4-million-square-foot project is as big as Tysons Corner

Center shopping mall in nearby Mclean, Va. The building's skeleton should be in place by spring 2008, and exterior construction should be completed within two years, with an additional year needed to outfit the interior spaces. In an example of collaboration, NGA and the joint venture partners will work together to oversee the project.

While a number of people may think of this structure as an end to itself, for others, this purpose-built home encourages NGA to think bigger and broader—there is a high-performance organization waiting to be born. Couldn't the new structure serve as a collaborative decision-making portal? What a grand idea: a place where the warfighter and others can efficiently assess the footprints of both friend and foe.

Consider this: the NCE will become NGA's legacy. If, as its home is designed and built, minds reach deep into the future and indulge the collective imagination, all involved will become geospatial intelligence entrepreneurs. If all accept ownership in the NCE endeavor—refuse to accept the concept of "cannot" and replace it with "can"—this will mark a most relevant path for our future. 

DR. EILEEN M. PREISSER

an NGA Geospatial Intelligence Officer, was matrixed to the New Campus East Program Management Office to direct the NCE Advocacy effort.



NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

GEOINT

It Makes the Difference

topographic line maps



commercial imagery



hydrographic charts

flood information products

Cyclone Disaster Relief Operations

NGA: Readiness, Response and Recovery

WWW.NGA.MIL



Courtesy of NASA



U.S. Marine Corps photo by Sgt. Bryson K. Jones



U.S. Marine Corps photo by Cpl. Peter R. Miller

U.S. Marine Corps photo by Sgt. Ezekiel R. Kitandwe



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